Mining CONGRESS JOURNAL

AMERICAN MINING CONGRESS

MARCH
1953

Disposal of 1140 long tons per hour of overburden and lean ore is easily accomplished by this Link-Belt 36-in. wide belt conveyor system.

TOTAL ENGINEERING

It's LINK-BELT's answer for improved belt conveyor performance

BELT conveyor efficiency begins with correct analysis of overall system requirements. And right from the start Link-Belt offers you unique advantages. Our engineers can apply broad experience to your bulk handling problems.

Working with a complete line of quality components, they can select the belt conveyor equipment best suited to your exact needs. What's more, Link-Belt has a nation-wide engineering organization that will follow through on every detail. This includes supplying all related equipment . . . building supporting structures and enclosures . . . erecting the complete job, if desired.

It's easy to see why "total engineering" results in top belt conveyor performance. For complete information, call the Link-Belt office near you today.

13,131-D

LINK-BELT

BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices in Principal Cities.

LINK-BELT builds a complete line of belt conveyor components

ALL TYPES OF ROLLER BEARING IDLERS

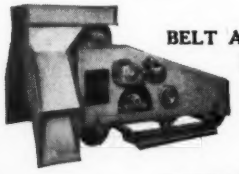
Impact-cushioning idler

45° troughed idler

Belt-training idler

20° troughed idler

Return idler

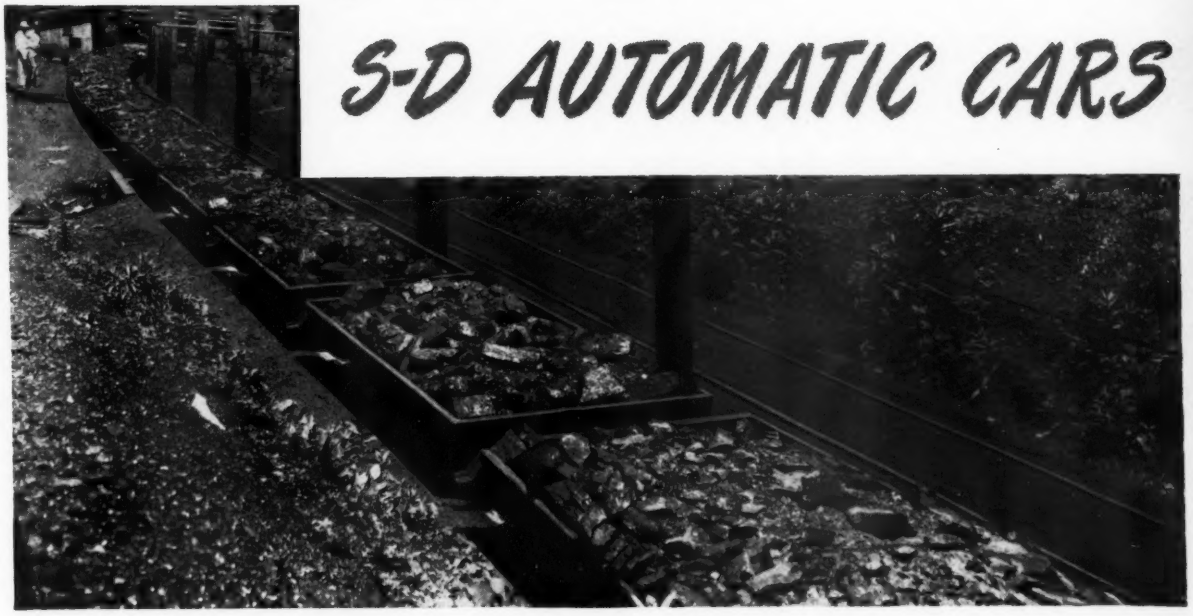


BELT AND MOTOR PROPELLED TRIPPERS

COMPLETE TERMINAL MACHINERY

Reduce Man-Hour Cost these 5 ways with...

S-D AUTOMATIC CARS



1. **Eliminate all manual operation at tipple . . .** S-D Automatic Drop Bottom Cars discharge the coal automatically. When each car in trip approaches opening between rails over Surge Bin, an automatic tripping device unhooks the drop bottom doors. As each car leaves Surge Bin a closing device automatically closes and re-hooks the doors as trip continues back to mine for re-loading.

2. **Use fewer trip crews.** The non-stop haulage provided by S-D Automatics gets longer trains of cars back to the mine faster.

3. **Operate preparaton plant with only one shift.** Usually, a one shift operation at the preparation plant will balance a two shift operation in the mine. The Surge Bin continues to take the coal as it is mined, storing it for smooth flow to preparation plant during a one shift operation.

4. **Prevent your preparation plant crew from standing idle because of delays at the face.** With S-D Automatics and an adequate Surge Bin, your preparation plant continues to take coal from the Surge Bin when there is a delay at the face.

5. **Avoid the costly down time of crews standing idle at the face because of delays at the preparation plant.** Remember, when there is a delay at the preparation plant, the Surge Bin continues to take the coal as it is mined.

Have one of our engineers show you how much money S-D Automatics can save you by reducing man-hour costs. Without question, S-D Automatics offer you the lowest cost method of main line haulage!

SANFORD-DAY IRON WORKS

KNOXVILLE, TENNESSEE

INSIDE AN EXIDE-IRONCLAD

Inside . . . where it counts most . . . EXIDE-IRONCLAD is entirely different than any other battery. It's made that way by EXIDE'S exclusive IRONCLAD slotted-tube construction . . . a principle that provides direct operating-hour savings for you.

OF *ALL* BATTERIES, ONLY EXIDE-IRONCLADS HAVE POWER TUBE POSITIVES

The positive plate is different . . . unique . . . exclusive. It is the most effective retainer of active material yet demonstrated in heavy duty service. Slotted tubes contain the active material. So fine are the slots that, while permitting easy access of electrolyte, they retard the active material from washing out, hold it during repeated cycles of charge-discharge, and the vibration of rough use.

Today's battery-powered equipment is being used harder than ever before. Unless the batteries have internal shock protection they tend to deteriorate under hard usage—both electrical and mechanical. Only Exide-Ironclad has the plus-protection of the tubular positive that can withstand today's more exacting and rigorous heavy-duty battery services.

Your EXIDE sales engineer will give you the factual inside story. See for yourself why *only* an EXIDE-IRONCLAD gives maximum day-after-day service under the most difficult operating conditions . . . *with a minimum of maintenance expense.*

THE ELECTRIC STORAGE BATTERY CO.
Philadelphia 2
Exide Batteries of Canada, Limited, Toronto

1888 . . . DEPENDABLE BATTERIES FOR 65 YEARS . . . 1953

Cross section shows relation of positive plate to separators and negative plate. Note the much greater exposure of active material to electrolyte as compared with that of the usual flat positive plate. This greater exposure makes possible the high power ability and uniform-voltage characteristics of the Exide-Ironclad. The negative plates have been made extra heavy to balance the increased capacity of the power tube positives.

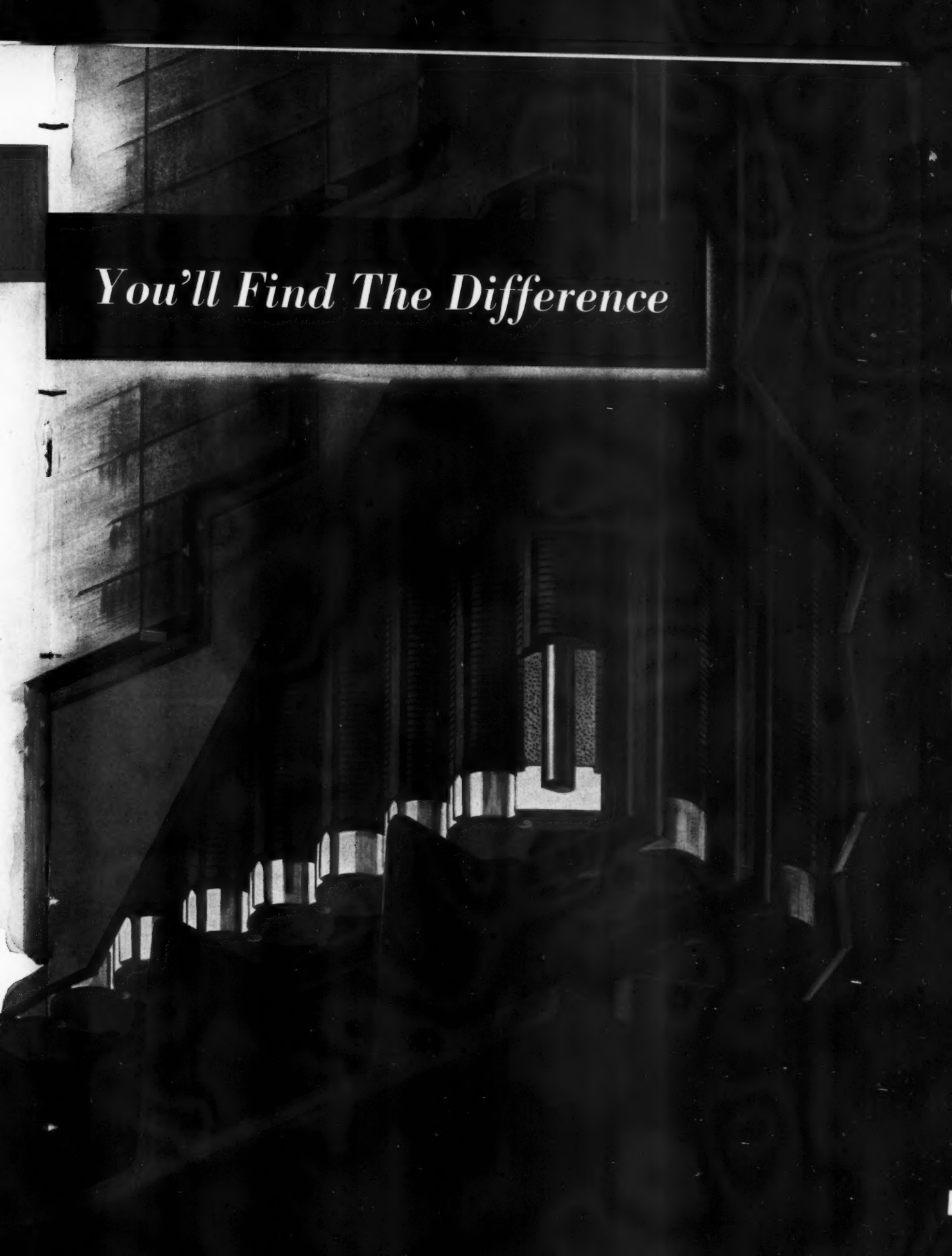
Running through center of each tube is an alloy core which is cast with the heavy top cross bar. These form the sturdy, non-buckling grid. Both core and top bar are made of Exide's new corrosion-resistant Silvium, an alloy of silver, lead and other components, which adds greatly to plate's long life.

New polyethylene insulating tube sealer of acid-proof, non-corroding plastic fits snugly into bottom of slotted tubes and further reduces loss of active material. Thus more active material remains available, and the high battery capacity is maintained for a longer working life.

Exide-Ironclad

YOUR BEST POWER BUY . . . AT ANY PRICE

"Exide-Ironclad" and "Silvium" *Reg. T.M. U.S. Pat. Off.*


You'll Find The Difference

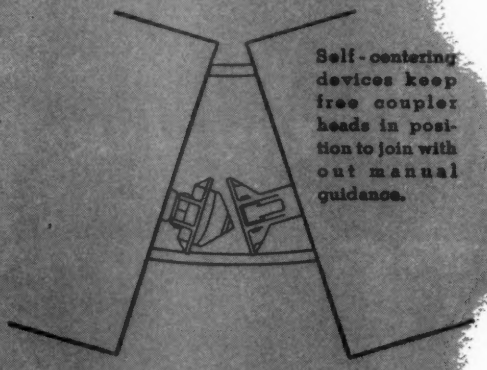
Ready to Join ANYWHERE, ANYTIME

O-B Couplers are Always in Position

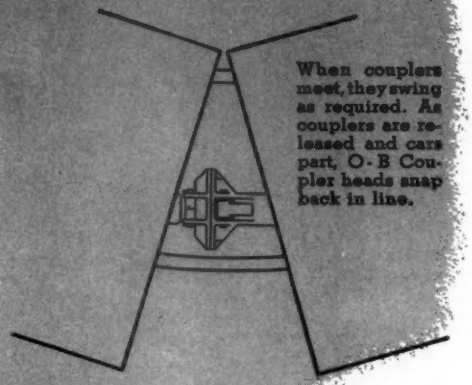
Self-centering devices hold each O-B Coupler head in line with its car centerline. Thus unengaged O-B Automatic Mine Car Couplers are ready to join at any point along the haulage way. Cars come together and fasten without guidance or assistance of any sort, because each self-centering O-B Coupler is in position to join with its mating head on the next car.

Once joined, the couplers of course swing to either side as required by the trip movement. But the moment a car is released, its coupler snaps back into position in line with the car center.

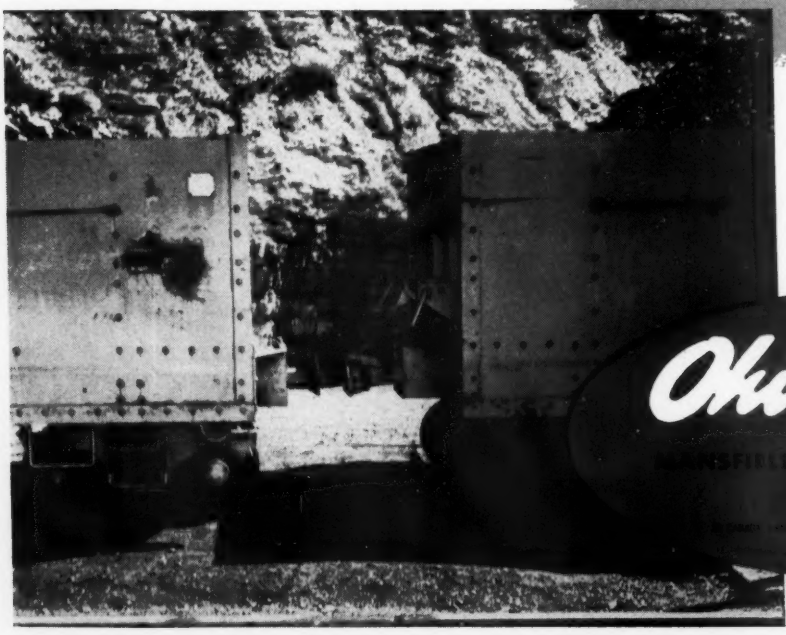
Because of their ability to join anywhere without adjustment or guidance, self-centering O-B Automatic Mine Car Couplers add speed and safety to haulage operations. That's one pretty good reason for choosing O-B for your new or remodeled cars!



Self-centering devices keep free coupler heads in position to join without manual guidance.



When couplers meet, they swing as required. As couplers are released and cars part, O-B Coupler heads snap back in line.



Just before coupling. Self-centering mechanisms have both heads in line with one another. No assistance is necessary.

Ohio Brass

MANSFIELD OHIO, U. S. A.

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"DOUBLED PREVIOUS YARDAGE RECORD"...

When He Switched to

Tuffy® Draglines

says Mine Operator in the Illinois Fields

Tuffy SCRAPER ROPE

Extra Yardage Cuts Rope Costs

A special rope, designed by wire rope specialists to stand up longer under drum crushing abuse, sharper bends over sheaves, angle pulls through swivel sheaves, other scraper rope abuses. Test its extra yardage handling ability! You'll want to change over completely when you see how much Tuffy Scraper Rope can help you save!

Tuffy DOZER ROPE

Users Report Up To 300% Increased Service

Now, there's no need to throw away 40' to 50' of good rope when 10' is crushed! Not when you're using Tuffy, the dozer rope specially constructed for dozer service. Tuffy has the stamina to go on handling the dozer blade. It is supplied on 150' reels for mounting on the tractor just back of the wedge block. Then you just cut off the 10 or 12 feet that may become damaged after long, hard service on the drum, feed in enough off the reel to replace it in half the time it would take for full replacement. Users report up to 300% increases in rope service. Write today for full information.

UNION WIRE ROPE CORP

union Wire Rope corporation

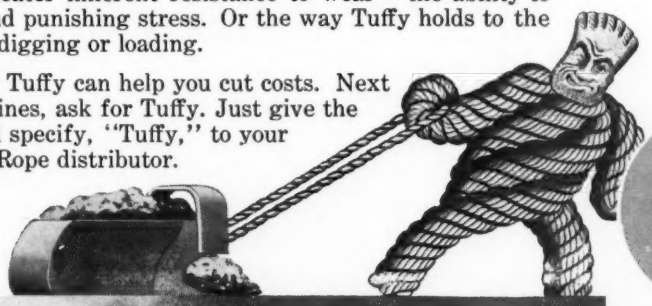
Specialists in Wire Rope and Braided Wire Fabric

EXTRA FLEXIBILITY of Tuffy
Proves Major Factor in Dragline Savings

"The last two Union Tuffy Drags went 721,000 cu. yds. and 555,000 cu. yds. respectively. The best of previous ropes are 300,000 or less. So you can see why we are so enthusiastic about Tuffy." (name on request)

Think of it! Savings up to 50% and 60% on dragline costs! And this is the usual—not the exceptional—report to our fieldmen from mine operators who have switched to Tuffy Draglines. The reason for such savings? Many attribute it to Tuffy's extra flexibility and special construction that allows bending in any direction without damage. Others claim it's Tuffy's greater inherent resistance to wear – the ability to withstand jerking and punishing stress. Or the way Tuffy holds to the drum when casting, digging or loading.

See for yourself how Tuffy can help you cut costs. Next time you order draglines, ask for Tuffy. Just give the length, diameter and specify, "Tuffy," to your nearest Union Wire Rope distributor.



Other Specially Designed Tuffy's For Special Uses

Tuffy SLINGS

9 part machine-braided wire fabric construction fights off knots and kinks, stands up longer than ordinary wire rope. Proof-tested to twice safe working load.

Tuffy MINING ROPE

Crab Motor Ropes, Winch Ropes to fit your needs—all Union-formed (Pre-formed) and designed to give maximum safety and service—at ultimate low cost.

Tuffy SLUSHER ROPE

Improved 3 x 19 gives maximum resistance to abrasion . . . is rigid, non-collapsing to eliminate drum crushing, yet elastic and flexible enough to take up shock loads.

SEND FOR THESE FREE FOLDERS

union Wire Rope **corporation**

Specialists — *In Wire Rope and Braided Wire Fabric*

2144 Manchester Ave., Kansas City 3, Mo.

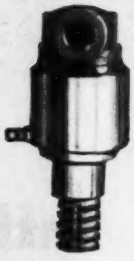
Please send me illustrated folder on:

☐ Tuffy Dragline ☐ Tuffy Scraper Rope ☐ Tuffy Slings
☐ Tuffy Dozer Rope ☐ Tuffy Slusher Rope

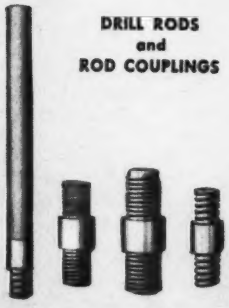
Firm Name_____

By_____ Title_____

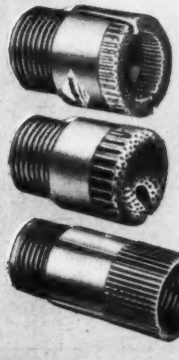
For DIAMOND DRILLING SUPPLIES
...depend on Longyear



WATER SWIVELS



DRILL RODS and ROD COUPLINGS



DIAMOND BITS and REAMING SHELLS

TRIED AND PROVEN FEATURES, developed through extensive field experience, are continually being incorporated into all Longyear drilling supplies. Whatever your requirements—core barrels or water swivels, drill rods or safety clamps—you can depend on getting the best when you specify . . .

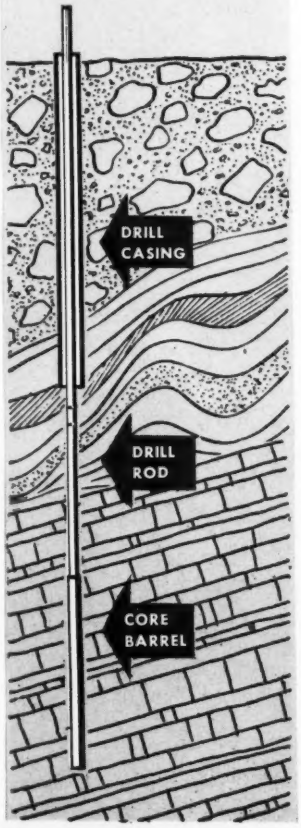
Longyear DRILLING SUPPLIES

- Bits
- Casing
- Core Barrels
- Core Lifters
- Core Splitters
- Deflecting Wedges
- Drill Hole Surveying Instruments
- Drill Rods
- Fishing Tools
- Hoisting Plugs
- Pressure Packers
- Safety Clamps
- Sampling Equipment
- Water Swivels

YOU CAN DEPEND, TOO, on getting the best of diamond bits promptly from Longyear's complete stock of standard core bits, casing bits and shoes and reaming shells. Selected stones, carefully set for maximum efficiency assure you of bits that will cut faster and last longer. Thereby you reduce your over-all costs. Special diamond bits can be obtained on order.

• Longyear engineers, qualified by years of experience, will help you select the tools best suited to your operation. For prompt attention to your requirements write to us TODAY.

SAFETY CLAMPS



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Minneapolis 2, Minn.

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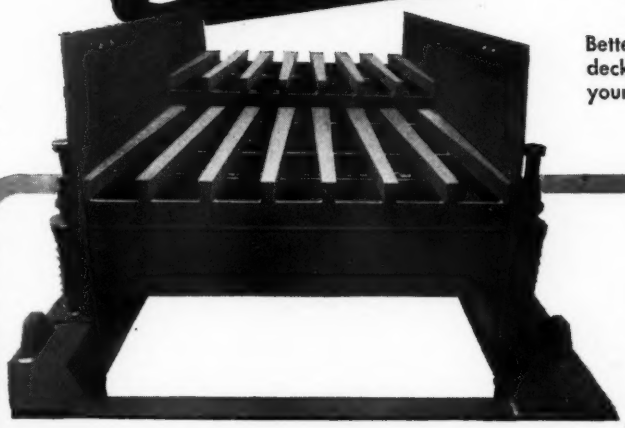
DIAMOND CORE DRILLS • CONTRACT CORE DRILLING
SHAFT SINKING • GEOLOGICAL INVESTIGATIONS

Special Decks for Primary Scalping

ALLIS-CHALMERS
Vibrating SCREENS



Will Give You...

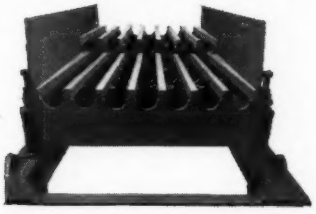
- ★ **MORE CAPACITY!**
- ★ **LESS PLUGGING!**
- ★ **LONGER LIFE!**

Better results in scalping with these special decks . . . designed to S-T-A-Y C-L-E-A-R on your heavy duty jobs.

Double Tapered Grizzly Bar Deck

(for openings 1 to 3 in.)

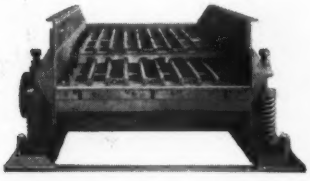
Longitudinal openings between grizzly bars stay clear because bars provide flared openings. Step deck turns material over, dumping fines from large pieces. Each bar is tapered from back to front and from top to bottom for additional freedom from plugging. Handles feed sizes up to 30 in. diameter.



Straight Grizzly Bar Deck

(for openings 4 to 10 in.)

For run-of-mine screen as shown above for use with straight instead of tapered grizzly bars. Openings between bars are flared from back to front for free material discharge. Handles feed in excess of 1000 tph in sizes up to 3 ft.



Steel Plate Deck with Skid Bars

(for openings 3 to 10 in.)

For run-of-mine scalping where positive scalping is desired. Steel plate decks with skid bars may be obtained with or without step deck construction. Plate deck is bolted to screen body and can be removed easily.

These special decks for primary scalping are available on both Style C and Extra Heavy Duty *Ripl-Flo* vibrating screens.

Ripl-Flo is an Allis-Chalmers trademark.

A-3938

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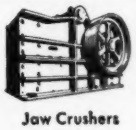
Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.

Hammermills

Vibrating Screens



Jaw Crushers

Gyratory Crushers

Grinding Mills

Kilns, Coolers, Dryers

For TOUGH jobs with years of work ahead...

MARION 111-M Ward-Leonard Electric shovel owned by the Hydro-Electric Power Commission of Ontario, making a cut for an open canal and recovering aggregate for concrete work.

MARION 111-M
Ward-Leonard Electric

Rock and ore have a way of making things rough for an ordinary shovel.

The machine may win, in the first few months, over the stubborn resistance of shot rock. But it still faces the test of time, for rock and ore "wear down" an ordinary shovel and break its spirit.

It's on the tough jobs, with years of work ahead, that the MARION 111-M Ward-Leonard Electric shovel has a chance to prove its real worth. Today this MARION is winning the battle of the rock pile and the ore pit on many a front.

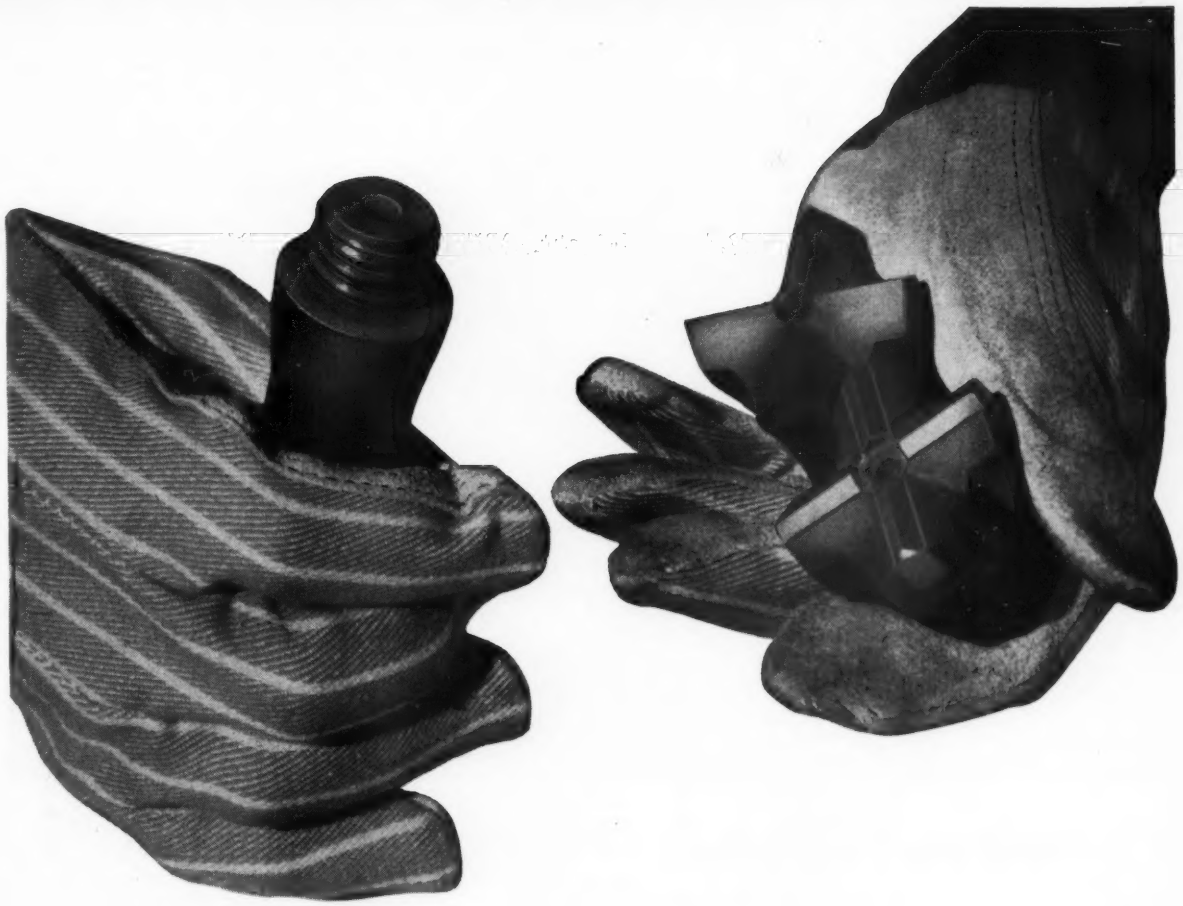
Its victories mean greater production, lower operating cost, less maintenance expense and fewer work stoppages. Its powerful electric muscles and the shock-tested members of its frames and machinery assemblies are making owners say, "This is it!"

It doesn't cost anything to find out what the 111-M Ward-Leonard Electric can do for you. Your nearest MARION office will be glad to give you the facts.

MARION POWER SHOVEL CO.
MARION, OHIO, U. S. A.

from ¾ cu. yd. to 45 cu. yds.

OFFICES AND WAREHOUSES IN ALL PRINCIPAL CITIES



One drill steel does the work of two with TIMKEN® interchangeable rock bits!

ONE drill steel serves two purposes when you use Timken® interchangeable rock bits. That's because both Timken multi-use and Timken carbide insert bits fit the same threaded drill steel! Drillers can quickly switch from one bit type to another as the ground changes—right on the job!

Use Timken multi-use bits for ordinary ground. When correctly controlled and reconditioned, they'll give you the lowest cost per foot of hole when full increments of steel can be drilled.

It's easy to make a quick switch to Timken carbide insert bits when you hit hard or abrasive ground. They're your best bet for maximum speed drilling, small diameter blast holes, very deep holes and constant gage holes.

Timken multi-use bits and Timken carbide insert bits are interchangeable in each thread series. And each type has these three important advantages: (1) made from electric furnace Timken fine alloy steel, (2) threads are not subject to drilling impact because of the special shoulder union developed by the Timken Company, (3) quickly and easily changed.

Call upon the 20-years' experience of our Rock Bit Engineering Service for help in selecting the best bits for *your* job. Write The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

your best bet for the best bit ... for every job

Dave O'Leary, Shop Superintendent, and Joe Koehn, Fitting Shop Foreman, look over a blueprint in the Heyl & Patterson Fitting Shop. Both men are 30-year veterans with Heyl & Patterson.

"Old Pros" with the "FOLLOW THROUGH" that counts!

The "Follow-Through" is one of the many ingredients that contributes to the successful performance records of Heyl & Patterson designed, fabricated and erected equipment.

Here is a picture snapped in the Heyl & Patterson Fitting Department. It's a "natural" showing how our shop men "follow-through" from the original designs of our Engineering Department. Compare the picture of these "Old Pros" with the "Follow-Throughs" you have seen on TV in batting scenes from the World Series in baseball and the important winning forward passes in pro-football games. The Heyl & Patterson "follow-through" is possible because we have our own Engineering Department, our own Fabricating Department, our own Machine Shop, our own Erection Department.

The H & P Engineering Department calls the signals and the other H & P Departments know how to "Follow-Through." This is why Heyl & Patterson can guarantee long-life, low-cost performance of Heavy Bulk Materials Handling Equipment.

Heyl + Patterson, Inc.

"SINCE 1887"

55 WATER STREET · PITTSBURGH 22, PA

Heavy Bulk Materials Handling Equipment

All The Way from Design to Erection

IT'S JUST THAT SIMPLE. There's only one reason in the world why 2 out of 3 wire rope users in the mining field prefer Roebling wire rope . . . *it costs a lot less on the job than any other.*

For maximum wire rope efficiency and economy, call your nearest Roebling office for a Field Man. He'll recommend the best ropes for your requirements.

ROEBLING CF&I

A subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

Jeffrey 12-A-83 AERODYNE Mine Fan

EFFICIENT MINE VENTILATION calls for complete understanding of operating conditions, plus high volume equipment with flexibility to meet specific requirements. Every Jeffrey Fan installation is engineered for the job it is intended to do. That's where our Jeffrey Ventilating Engineers can be of service. Shown above is a typical AERODYNE installation at the Colorado Fuel and Iron Corporation property in Colorado. Here again is tried and proved ventilation.

JEFFREY AIR-OPERATED BAUM JIGS make possible a new high in capacity at minimum cost per ton of coal washed. Difficult separations are effectively made even at low specific gravities down to extremely small sizes. Unit shown (right) is a 72-inch, two-compartment, four-cell air operated Jig. It is cleaning 6″ x ⅜″, Pittsburgh seam coal—production averages 227 tons per hour with plant feed coal. For better cleaning at low cost, consult a Jeffrey Preparation Engineer.

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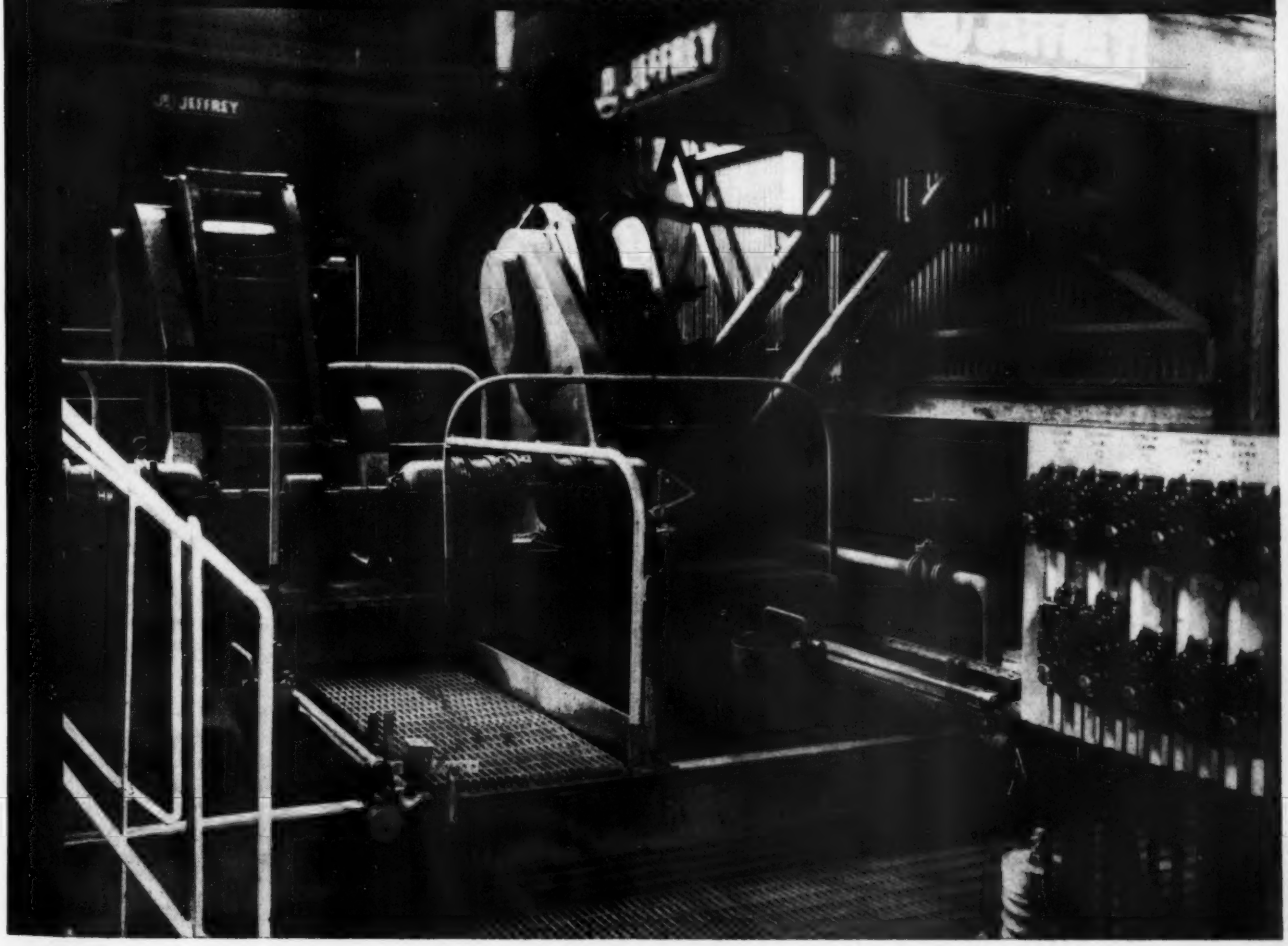
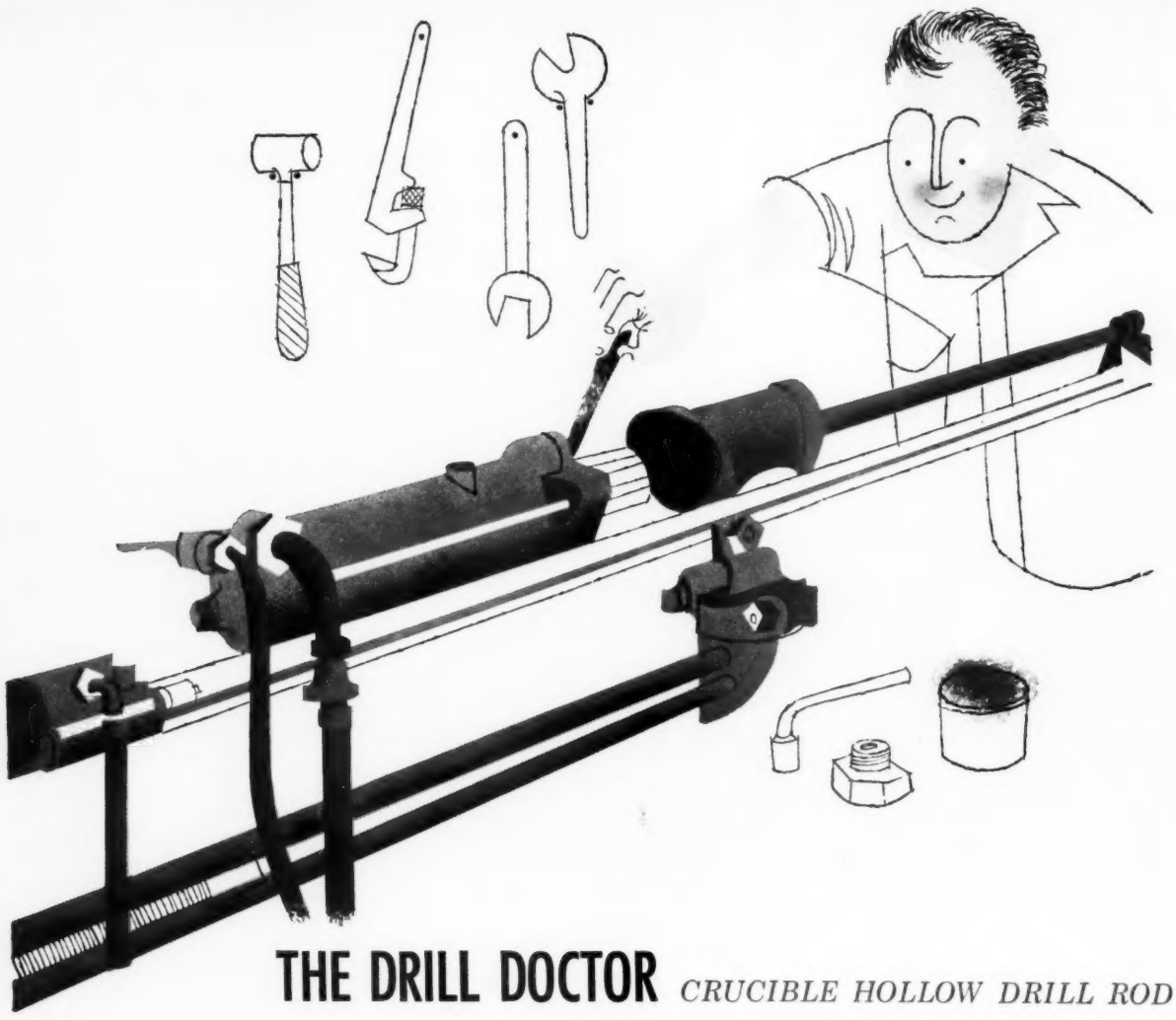
Jeffrey 72-inch, two compartment, 4-cell air-operated Baum JIG





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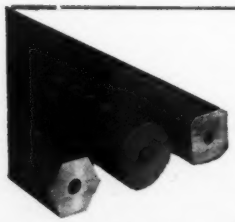

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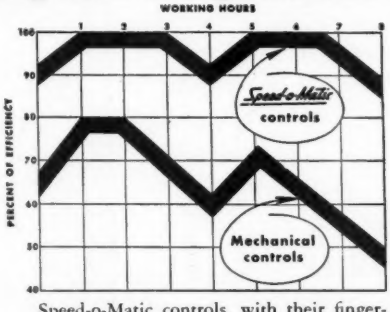

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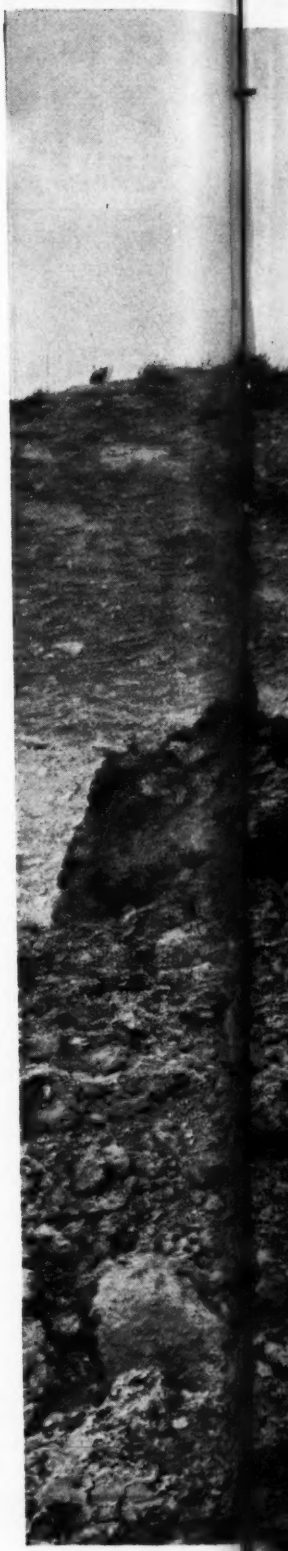

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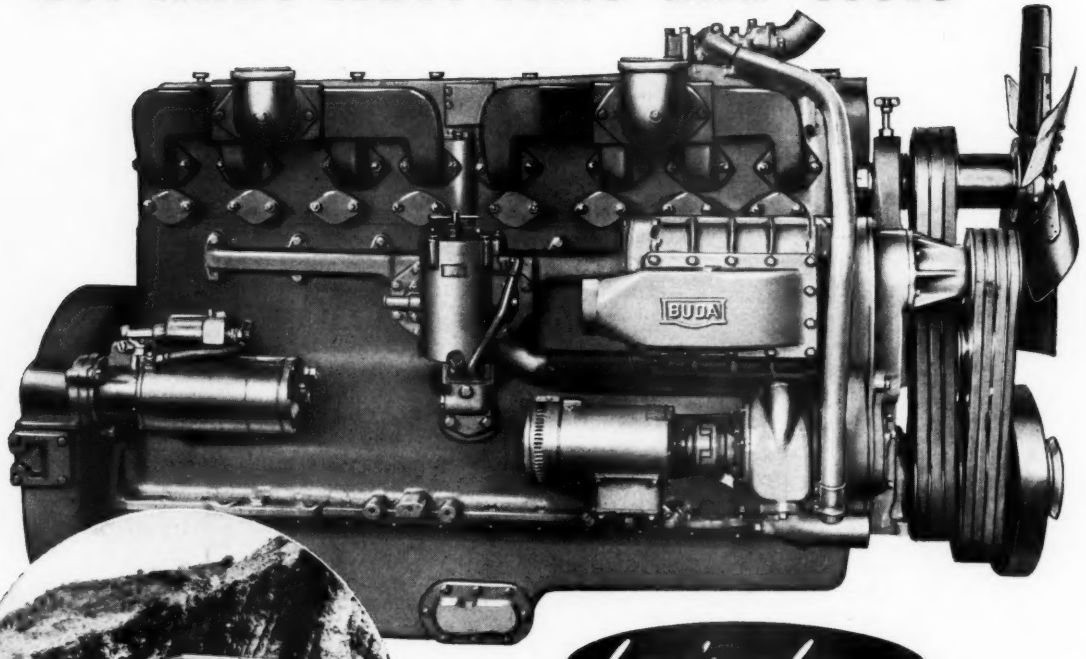

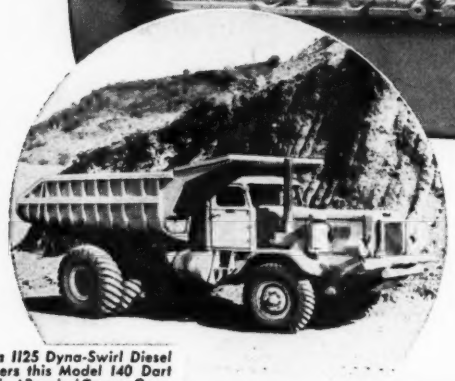

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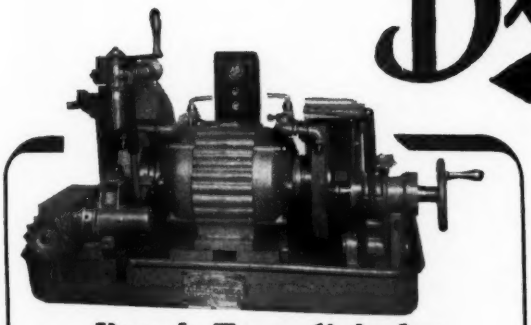

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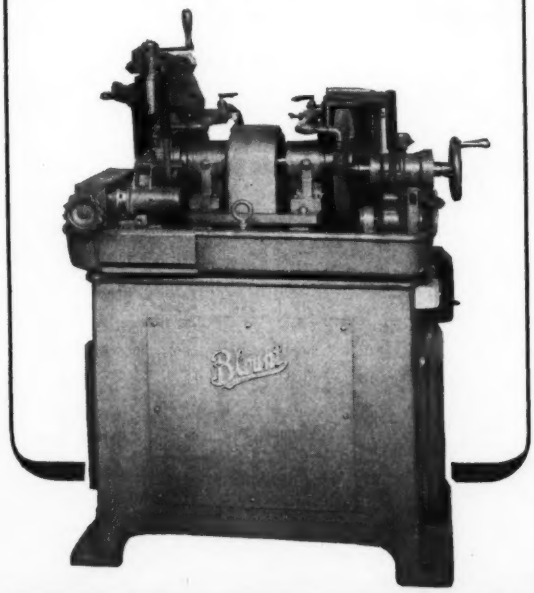

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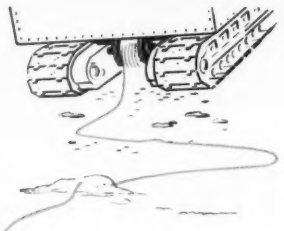

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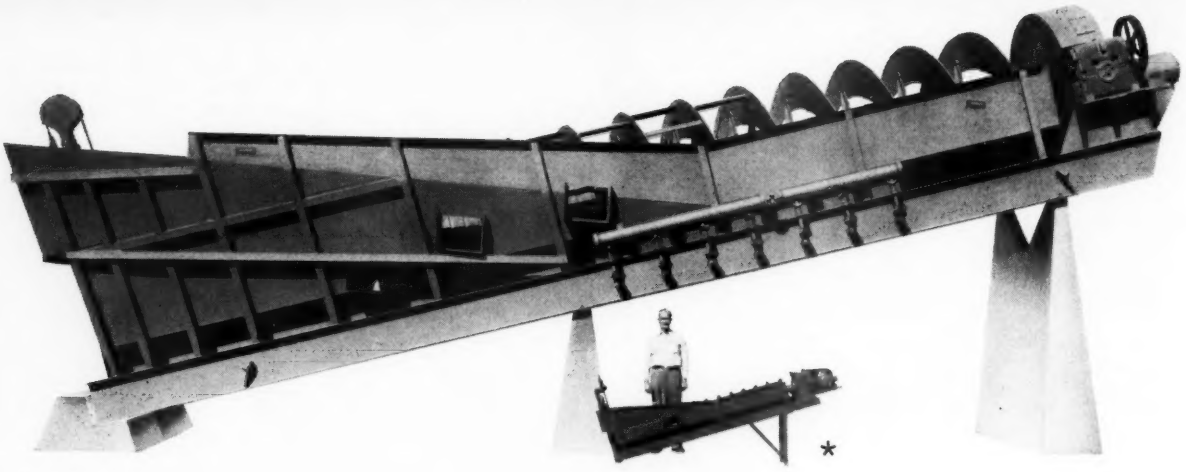

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Editorials

JOHN C. FOX, *Editor*

MARCH, 1953

Dead Ducks and Coal

CONGRESSMAN James E. Van Zandt (R., Pa.) and nineteen other members of the House of Representatives have introduced bills which would establish a quota limitation on the amount of residual fuel oil brought into the United States. They would restrict such importation to 5 percent of the domestic demand for residual oil in any calendar quarter of the past year.

Coal cannot begin to compete with this fuel. The "garbage" left over after refining, its cost to the producer is practically nil. It can be sold along the eastern seaboard for little more than the cost of transportation as ballast in ships which would normally return light.

The 126,964,000 barrels of residual fuel oil dumped during 1952 into markets, which normally use coal is the equivalent of 30,469,000 tons of bituminous coal. This amount of coal is equal to the entire output of more than 32,000 miners for a full year. But the hardships caused by short work weeks and no-work weeks, on these miners and their families is just one of the evil effects of the loss to the coal mining industry of this huge segment of its market. The miners may find jobs in other industries and many of them have. The greater evil lies in shutting down of coal mines and dispersal of the companies that own them.

While no one can truthfully say that World Wars I and II were won by coal alone, neither can it be said that either could have been won without coal. Into every ton of steel produced goes one ton of coal, one ton of iron ore and two tons of limestone and other materials. Well over one-third of the present energy load of the United States is carried directly by coal. In the defense effort, in the event of all-out war production or even granted peaceful growth in our time, the requirements for coal to make steel, to supply electrical energy, as a chemical raw material are going to rise sharply.

If the sea lanes are suddenly cut off and we are, at the same time, called upon to increase industrial production, how soon can those plants in the highly industrialized east reconvert boilers and power plants to the use of solid fuel? And time is required before an abandoned mine can be brought back into production, if it can ever be brought back. Add to this the absence of experienced miners, who weary of waiting and with many mouths to feed, have drifted into other callings.

The picture is blacker than the inside of an idled coal mine. And it may grow worse if the past is any indication of the future. In the seven years 1946 to 1952, inclusive, importations of foreign residual fuel oils more than trebled. There is no guarantee that the trend will not continue.

Anyone who has ever seen wildfowl along the seacoast, where ships have discharged the sticky sludge from their fuel tanks into the sea, knows how the tarry residue can cause the death of even the strongest ducks. A law was passed prohibiting such practice to protect the ducks.

The domestic coal industry is struggling to overcome the competition of cheap foreign residual fuel oils. Unless it has protection, it too may be a dead duck.

A Sound Labor Relations Program

Why Amendments to Existing Labor Statutes Are Needed

By HON. WINGATE H. LUCAS
Member of Congress from Texas

IT is difficult to prophesy what the 83rd Congress will do with the Taft-Hartley Act. Yet, in spite of the difficulties of prophesying on such a ticklish subject enough information is available to make possible some deductions.

It is virtually certain that labor legislation of some sort will constitute a major struggle during the first session and probably the 2d session of the 83d Congress. What can we do about it?

American citizens should be thinking now of how to protect the best features of the Taft-Hartley Act, as well as deciding what, if anything, can or should be done to improve our national labor policies.

The time has come for American management in all areas of business activity and the American people to decide on a long-range objective. This should be the reduction of the role of the Federal Government in labor-management relations.

Basic Concepts Developed

How can this objective be reached? First, let us review some past history. The original Wagner Act was passed seventeen-odd years ago. At that time our Nation was struggling with the many problems associated with a great economic depression.

Out of the welter and confusion that surrounded the early days of the first Roosevelt Administration, certain concepts were developed.

One of these, and a premise upon which the Wagner Act was built, centered around the theory that it was essential that wages be increased more rapidly than prices to create the purchasing power necessary to pull America out of the depression. The Wagner Act was deliberately designed to give the forces of labor a preponderance in the economic scale.

One of the major battle grounds centered around the desire of the AFL—the CIO had not yet come into existence—to have the law not only permit, but encourage the selection of collective bargaining agents who were not actual members of the groups to be represented.

Employers of that day were almost universally opposed to this principle, although many had indicated acceptance of the theory of collective bargaining even before the passage of the Wagner Act. One of the major targets of the original Wagner Act was the so-called company-dominated union.

When the Wagner Act was adopted, not many foresaw the giant labor monopolies of the late forties and of today. Representatives of the automobile industry did point out this possibility, but the warning was looked upon as another of management's unjustified fears.

Management representatives pointed, also, to examples where unions had exercised a local monopoly power by excluding, through the device of the secondary boycott, nonunion materials. But here again the possibility of the national labor monopoly was decried.

And so, the Wagner Act was passed. It contained, as the AFL had demanded, a provision permitting the certification of outside representatives for employes; in other words, professional union organizers.

And to repeat, it was passed on the premise, among others, that labor should have its economic strength increased beyond that of the individual employer.

Organizer Protected

And so, it came to pass that the professional labor leader was afforded the protection of law far beyond that ever accorded any other trade or profession. You are aware, of course, of the many instances where these people have proved themselves beyond the reach of the law. Condonation of violence in union organizational drives became the rule rather than the exception, even in the courts.

Once the Wagner Act was approved, its administration strengthened the position of the organized labor leader. For many years, it was virtually impossible for any organization not affiliated with either the AFL or CIO to receive the NLRB stamp of approval.

Lack of such affiliation was regarded by the old NLRB as *prima facie* evidence of domination by the employer. The Taft-Hartley Act went a long way toward strengthening the position of the independent union. But we have not gone far enough.

Need Independent Unions

If there is any type of organization adapted to maintaining the economic balance in America, without the constant paternalistic interference of the Federal Government, it is the independent union. Independent unions are the greatest single factor in maintaining peaceful labor relations — in achieving fair play for all concerned: management, labor and the public. By independent union is meant a union not affiliated with any of the great national labor organizations; a union that is truly independent of domination from any source.

Let Employes Control Union

What we must do, and in the near future, is to return the control of collective bargaining to the employes themselves. That is the only way we will ever be able to establish an equality of bargaining power between labor and management. The right of the employe to organize and bargain collectively must remain inviolate. But this does not mean that the employes of competing employers should be represented by a common bargaining agent. Therein we find the basic and fundamental defect in the Wagner Act—a defect which we were not able to correct when the Taft-Hartley bill was enacted.

We did attempt to correct this basic fault. In fact, the Hartley bill, as passed by the House of Representatives, would have established for the

first time in Federal law equality of bargaining power between labor and management. Unfortunately, the Hartley bill restrictions on industry-wide bargaining, as presented to the Senate, were defeated by a single vote and the final law did not deal with this problem.

Bargaining Power Unequal

Thus, the Taft-Hartley Act, as it exists today, did not solve our major problem—that of establishing equality of bargaining power between management and labor.

It is fitting, at this point, to define what we mean by inequality of economic power as it now exists between employer and labor union.

In essence, the overwhelming power of the labor leader rests on monopoly. Not monopoly as it has been defined at law and interpreted in court decisions, because in both of these areas the tendency has been to look upon monopoly from a narrow and restricted point of view.

Labor Monopoly Defined

Monopoly, in the true economic sense, as opposed to the legalistic approach of the anti-trust laws, exists whenever the reasonable available supply of any given commodity or service is subject to common control. By way of illustration: Whenever there exists but a single grocery store in a given shopping center, that single grocery possesses a monopoly insofar as the nearby customers are concerned. This is a most limited monopoly because any unreasonable exercise of the monopoly power would undoubtedly drive the customers to less convenient but nevertheless accessible sources of supply. Furthermore, should this particular grocer enjoy an enviable profit as a result of his monopoly position, he can be sure that a competitor will soon appear next door.

This same situation exists in the labor field, where the union, if it represents the employes of competing employers, enjoys a monopoly. Unfortunately, such monopoly has been actually encouraged by our national labor policy. Moreover, it is worse in the labor field than in the case of the grocer. The customers of our grocer may break his monopoly by a brief excursion to the next nearest shopping area, but the labor monopolist has no such fears; nor need the labor union fear the advent of a competitor because in most areas its control of the available labor supply is absolute.

We must be prepared to end once and for all any combination which results in restraint of trade, regardless of how insignificant such restraint may be from a national viewpoint. This must be done in the public interest, if our liberties are to be preserved.

Return control of collective bargaining to employes themselves

Against Public Interest

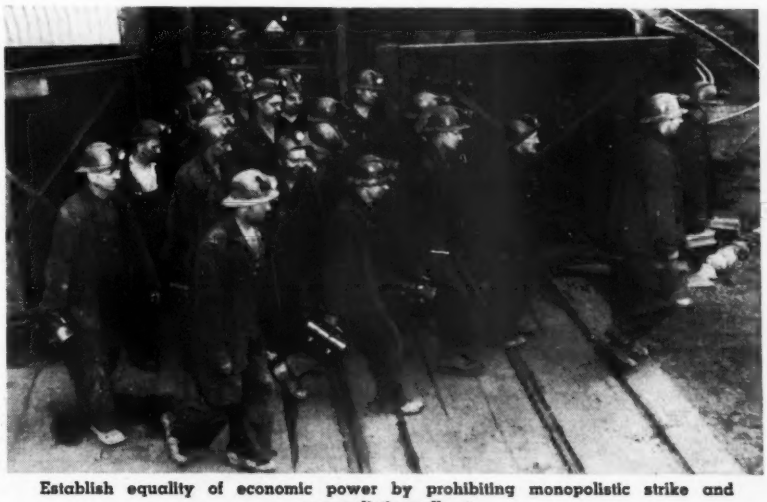
Whenever the form of collective bargaining, carried on in mining or any other industry, results in collective bargaining decisions by competing employers, it is monopolistic. Conversely, collective bargaining on behalf of employes of competing employers is equally monopolistic. Both should be prohibited. There may be many instances where such a prohibition will disrupt traditional bargaining patterns which have been superficially successful for many years. The fact remains, however, that such practices are detrimental to the public interest and must be eliminated if we are to ever get our national labor policies on a sound and enduring basis.

My proposed amendment to the Taft-Hartley Act will probably meet with substantial industrial and business opposition, as well as the opposition of the labor leaders. It can only be hoped that management and the American people can be convinced that we must abandon the practice of joint collective bargaining to reach the end-objectives of reducing government intervention in labor-management relations to an absolute minimum.

How Amendment Works

Here is how this bill would establish an equality of economic power between labor and management: To begin with, the amendment to the Labor-Management Relations Act would prohibit both the monopolistic strike and the monopolistic lock-out. Each is defined in the bill as a strike or lock-out which may result from a concerted plan of action by competing employers or the employes of competing employers.

This prohibition is enforced in precisely the same manner as are other unfair labor practices now listed in the Taft-Hartley Act. That is, in the case of the monopolistic strike or lock-out, an NLRB proceeding including



Establish equality of economic power by prohibiting monopolistic strike and monopolistic walkout

the use of a temporary injunction is provided, and those who suffer as a result of the unfair labor practices are given an action for damages.

To provide for simplicity of administration, and to prevent an excessive burden upon NLRB, certain exceptions are permitted. Specifically, employes of competing employers located within 50 miles of each other and each employing less than 100 persons are permitted a common bargaining representative. A strike of such employes is not included within the definition of a monopolistic strike against which the main provisions of these proposals are directed.

No Disadvantage to Employer

It has frequently been asked if this proposal does not place the employer at a disadvantage. The answer is no.

Let us assume an industry where all the employes belong to a single union. This means that the entire labor supply, with the possible exception of some of the unskilled workers, is under the dominion of the international union. In its dealings with the employers in this industry the union can follow two possible procedures in its collective bargaining.

Under one possible procedure, usually followed where the commodity produced is basic in the sense of being an essential raw material for other industries, the labor leader will bargain with all employers at one time. This procedure is followed in bituminous coal. In this instance, the labor union is in a position to close down the entire industry—and has no hesitancy in so doing. As a result, the pressure of public interest is brought to bear against the employers as a whole and no single producer can resist the union demand for very long.

The other procedure followed approaches the bargaining on a "divide and conquer" basis as follows: The union will make its demands on one or two producers and leave the others alone. This means that an unsuccessful bargaining session may well find one or two producers struck, while their competitors proceed to capture the market. This is the method followed in the automobile industry. This may, at first glance, appear to be free play of economic forces. It is actually not so, because it is within the power of one labor leader which group of men will not work and which producer will be first brought to terms.

In neither instance can the employer exercise economic strength in proportion to the union.

Legislation Is Needed

There is only one way that the economic balance can be established. That is to enact legislation which would prevent, with minor exception, the combination of the employes of competing employers for collective bargaining purposes. At the same time, collusion on collective bargaining policies by competing employers must be prohibited. Such a law will reduce the area of collective bargaining to the company and local level. This will serve democratic processes.

This does not mean the reestablishment of the company-dominated union. There is no intention of going back to that period in our industrial history where the collective bargaining representative was required to be an employe himself. The professional labor organizer is here to stay.

Unions Remain Intact

It is also charged that this proposal would fragmentize the unions—that it would destroy the role of the international union in labor relations.

This is not true. The international union will remain a major factor in industrial life. No one seriously contends that a trade association is powerless because it may not exercise control over the prices charged by its members. Likewise, the international union can exercise similar power and influence without controlling the wage rates of its locals and without possessing monopoly power over whether or not its members work.

Keep Government Out of It

It is too well known that the labor monopolists are attempting to create a situation where, by economic coercion, they can secure from employers through government intervention more than could be obtained through free collective bargaining. The recent steel case best illustrates such tactics. The unions strive for such power that even the Government must yield to their demands. In no society of free peoples should such power exist. The monopolies of business were restricted years ago. The monopolies of labor must now be restrained. The cartelization of labor will lead inevitably to cartelization of business, whether the government helps, whether expansion occurs through failure to take corrective action before such giant organizations gain so much political power that actions in restraint are impossible.

The Communist Threat

Those in the mining industry are all too familiar with the domination of unions by those who are not loyal to American principles. The Communist-dominated labor union must go!

No one seriously disputes this; that is, no one who holds dear the freedom for which we fight. The question always turns on just how we may remove this blot from our escutcheon. Constitutional lawyers, even on the Supreme Court, seldom agree, and the cry of unconstitutionality is always heard when attempts are made to limit the activities of labor organizers, even when such people are either well-known fellow travellers or are avowed Communists.

The Taft-Hartley Act should be amended to provide that no Communist-dominated union should enjoy the benefits of the National Labor Relations Act. Such a prohibition would replace Section 9 (h) requiring an anti-Communist oath of labor union officers. While this section has been effective, its weaknesses are revealed in cases where a union officer signs the oath, and yet, proclaims his loyalty to un-American principles. Attempt was made to have the oath include all those who had ever been Communists, but the House, believing in the doctrine of repentance, and hoping to encourage a purge in some unions, declined to make it read stronger than mere present membership in the Communist Party.

Set Up A Board

The remedy lies in denying the processes of Taft-Hartley to every union which is Communist-dominated. I believe it is not necessary to write a definition of "Communist-dominated" in the law. A permanent Board could be created to hear all the evidence, when any such charge is made, and to find, as a matter of fact, whether or not a union is dominated or influenced by officers or others who are following the Communist-party line. Such a Board might be comprised of retired Federal judges, empowered to hear evidence anywhere in the United States, or its territories and possessions, and then to certify to the NLRB one fact—and only one fact: We find "X" Union is Communist dominated, or, we find that "X" union is not Communist dominated.

That fact, being certified to the National Labor Relations Board, would be acted upon or not acted upon as the Board would see fit. But, if an affirmative answer was found, the National Labor Relations Board would have to decertify or refuse to certify any labor union so found to be Communist-dominated.

It should be added that that finding of Communist-dominated union should preclude the union from enjoying the benefits of the National Labor Relations Act for a period of at least three years.

Though it may be unnecessary, and perhaps even incongruous to include like provisions in the law aimed at Communist-minded employers, such provisions should be written into this proposed legislation.

(Continued on page 71)

Maintenance of truck roads is an item of major importance at Inspiration's Thornton pit

Truck Haulage and Maintenance

By H. C. WEED and CHARLES A. LINDBERG

Assistant General Manager
Inspiration Consolidated Copper Co.

Supervisor of Truck Maintenance,
Oliver Iron Mining Division,
United States Steel Corp.

In The Southwest

By H. C. WEED

TEN copper mines in the Southwest and Northern Mexico have contributed data for this paper. In seven of these mines are the only means of haulage, while in three of the mines trucks are used in conjunction with railroad haulage.

First open pits with trucks as the only means of haulage were opened in 1942 when Castle Dome and Cananea started operations. This was five years after the first trucking on the Mesabi Range, and advantage was taken of Mesabi experience.

Other open-pit mines now using trucks exclusively are Bagdad, Inspiration, Ray, Bisbee and Silver Bell. Of these, Bagdad converted completely from underground mining to open-pit mining. Inspiration and Ray converted portions of their mines to open pits, and Bisbee and Silver Bell are opening new ore bodies for open-pit mining. Miami Copper Co. is opening a new pit at Copper Cities.

Morenci, Ajo and Chino are completely open-pit mines with railroad being the main means of haulage. Trucks are used in all these mines, principally in stripping areas which are not convenient for rail haulage. Morenci and Ajo were early users of trucks for auxiliary work.

At present 173 trucks move an average of 262,500 tons of material each day, or an average of 1517 tons per truck per 24-hr work day. Assuming 307 work days per year, over 80,500,000 tons were moved by trucks at these ten mines in 1952.

When compared to the more than 1400 trucks in use on the Mesabi, the 173 here being discussed may not seem very impressive, but in terms of ore production, either new or produced at decreased costs, the effect of truck haulage on southwestern copper mining should not be underestimated.

The pay load of the trucks in use varies from a low of 15 tons for a few of the older trucks to 45 tons for two Tournarockers which are used as trucks in one mine. The majority carry a pay load of from 22 to 35 tons with all of the newer trucks carrying 30 or more tons. The accompanying tabulation shows the make, units in use, number of engines, total horsepower, number of rear axles, and pay load of the trucks.

Buda, Cummins, General Motors and Hercules diesel engines are used in the trucks with Cummins being in the majority. Allison butane engines are used in the Tournarockers. All trucks are rear dump and all have power steering. Torque converters are almost evenly divided between Allison, Schneider and Twin Disc. Only one operation is without at least one truck equipped with a torque converter, and this operation reports torque converters on order for all of their trucks. Converters are steadily being installed in the older trucks. The consensus in the Southwest seems to be that, although still in the development stage with much more to be learned about their performance, the torque converter is well worth while. The smooth even application of full power at all times is a definite advantage. Shock loads are absorbed in the converter and repairs are reduced. This is especially true in the larger units where individual parts of the drive system have not at all times kept up with the advance in available horsepower. In some instances the installation of a torque converter has allowed the pay load to be increased, particularly on grade hauls.

All operations load trucks on both sides of the shovel. Six of the ten companies use a pit man or a spotter

at the shovel. The duties of this man include cleaning rocks from under the tires before starting the truck and cleaning rocks from the truck pattern before backing in a truck, as well as responsibility for the proper spotting of the truck. At the waste dump a berm is maintained at six operations and seven keep a pit man or spotter at the dump. In some cases the man also acts as a sampler. In four of the pits right hand driving is standard while two report left hand drive as standard. The four others drive either right or left as local conditions indicate advantages. No difficulty from a safety angle was reported by these last four mines.

Average length of haul ranges from a low of 0.3 mi to a high of 2.5 mi, and the grades on the haul from a low of 3.0 percent to a high of 18 percent. Some waste hauls are level or downhill. Because of these wide variations in factors which contribute greatly to the costs of haulage even when calculated on a per hour basis, no cost figures were requested from the contributing companies.

TABULATION OF TRUCKS IN USE

Make of Truck	Units in Use	Single or Dual Engines	Total HP	Single or Dual Rear Axles	Payload
Dart	20	Single	300	Single	25
	2	Single	280	Single	25
	4	Single	350	Single	25
	7	Single	350	Dual	32
	7	Single	350	Dual	35
	5	Single	240	Dual	24
	3	Single	300	Dual	24
	4	Single	300	Dual	30
Euclid	4	Single	150	Single	15
	10	Single	280	Single	22
	17	Single	300	Single	22
	8	Dual	380	Dual	34
	16	Dual	400	Dual	34
Knuckey	8	Single	150	Dual	30
	5	Single	275	Dual	30
Kenworth	5	Single	275	Dual	30
Locally built from older Units	3	Single	200	Single	22½
Mack	18	Single	200	Dual	30
	25	Single	300	Single	25
Tournarocker	2	Single	500	—	45

All Drivers Trained

All of the operations consider driver training a matter of considerable importance. The extent of the training varies from breaking in with a qualified driver as an instructor to breaking in with a truck foreman as an instructor with further checkup by the same foreman. This latter method is said to have reduced maintenance costs quite noticeably. To elaborate on this particular program, one of the best drivers was promoted to the position of truck foreman and placed in charge of all driver training and driver activities. He trains the men who are coming up for drivers and checks them out as they become qualified. Whenever possible a new driver is started on the day shift for close observation. With three shifts' operation, each driver is observed two weeks out of six. A surprising number of poor driving habits are caught among the old drivers. Driver cooperation with this foreman has been excellent and the company is convinced that the program is paying dividends.

Heat and dust complicate maintenance problems in Arizona copper mines

Road maintenance is recognized as an exceedingly important feature and each company has one or more road graders and sprinkling trucks in operation. In most cases the grader is used only on the day shift when visibility is best. The sprinkler trucks are in constant use except during the brief rainy spells. Keeping down dust is of utmost importance both from a safety and engine maintenance standpoint.

Regular checkups are a feature of preventive maintenance programs

Preventive Maintenance

Prime importance of preventive maintenance on trucks and engines is fully recognized. All companies operate with a scheduled inspection and greasing of the trucks including regular oil changes and air cleaner servicing on the engine. In addition, regular engine checkups and tuneups are scheduled. Half of the properties schedule a bearing and cylinder inspection at from 2000 to 2750 hrs regardless of the behavior of the engine. At two of the mines a complete overhaul is made at this time. Engine life between major overhauls ranges from 2000 to 6000 hrs and averages 3920 hrs. Two of the reporting companies are not included in this average. One company reported "too new to tell" on all trucks and another reported "two new engine types without sufficient hours to report."

All companies do the minor repair work on their engines and six do their own major overhauls. Four of the companies send their engines to an outside shop for major overhauls.

Tires are an important item of cost in truck service. Tire life as reported in miles range from a low of 10,000 to a high of 22,500. This varies greatly with the single rear axle truck and the dual axle truck which carries four more tires per truck. It is interesting to note the highest averages are reported by companies who use dual rear axles exclusively and the lowest from those using single rear axles exclusively. On the basis of an estimate, it would appear that the total tire cost per mile does not vary greatly between the two types of trucks.

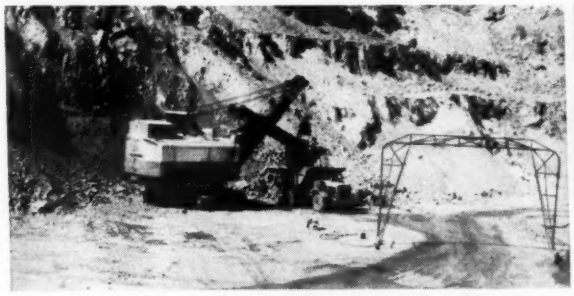
Recapping of tires is standard practice of eight companies, the percentage of tires recapped ranging from 5 percent to 80 percent, and averaging 32 percent. In recent years the cost of a recap has not risen as rapidly as the cost of new tires which favors recapping. It is, however, essential that a tire be recapped before the carcass is damaged and a tire which requires too many section repairs will not ordinarily repay the cost of the repairs and the recap.

Radio Speeds Repairs

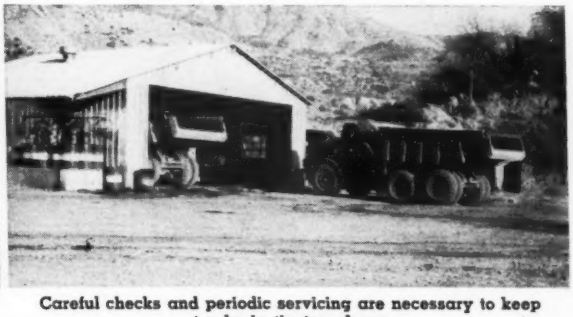
Auxiliary equipment for cleaning up around shovels and maintaining the dumps consist of D-8 and TD-24 Bulldozers, DW-10's with dozer blade, and Tournadozers. Due to the greater mobility in this work the latter two have replaced the regular bulldozers in most of the operations.

Sufficient light trucks are used by each company to properly supervise and service the operations. Seven of the ten companies have the supervisors' trucks and service trucks equipped with radio to speed up repairs and control operations.

The writer wishes to thank the managers of the following companies for their cooperation in furnishing material for this paper: American Smelting and Refining Co.; Bagdad Copper Co.; Cananea Consolidated Copper Co.; Castle Dome and Copper Cities Copper Co.; Isbell Construction Co.; Kennecott Copper Corp.; Chino and Ray Mines Division, Phelps Dodge Corp.—Ajo, Bisbee and Morenci branches.



Truck roads must be sprinkled often in dry Arizona



Careful checks and periodic servicing are necessary to keep trucks in tip top shape

In the Minnesota Iron Country

By CHARLES A. LINDBERG

IN 1937, trucking in the Minnesota iron mining industry began with the use of conventional 2 to 5-ton standard trucks, the first strictly off-the-highway mining trucks in those days being the 15-ton 2-axle trucks powered with 150-hp diesel engines. In the 15 years that have elapsed since that time, the number of trucks has increased to over 1400. The common size now used by the larger operators is the 35-ton, tandem rear axle truck, with 400-hp driving power in one or two diesel engines; some models have straight mechanical transmissions of 8 to 10 stages; others single 4 or 5-speed transmissions with torque converters; and still others semi-automatic transmissions with converters. The trucks are straight end dump, and include air starters, heated bodies, telescopic hydraulic hoists, power steering, and are completely sprung. An experimental 45-50-ton truck, with two 300-hp diesel engines with converters and semi-automatic transmission, is now undergoing trial. There are two 50-ton, 550 hp butane powered rocker dump trucks also under test, as well as a limited number of bottom and side dump semi-trailer units of 20 to 35-ton capacity.

During recent years the movement of ore and stripping has changed from steam and rail to road haulage, with trucks moving 84 percent of the 104,000,000 cu yds of stripping in 1951, and 64½ percent of the 74,500,000 tons of iron ore mined in that year.

Rapid transition in designs and materials, in sizes, powers, fuels, gear boxes, and forms of drive, has made it difficult to establish a system of preventive maintenance that would remain in effect long enough to establish a pattern. As a result, our form of maintenance, with the new designs now in use, is more correctly described as "Productive Maintenance," to borrow a phrase from a leading electrical company.

Feature Frequent Checkups

This takes the form of a very complete daily service period which includes a mechanical check, and affords an opportunity for the drivers to make known their observations, which often signal the approach of trouble. Included in the truck specifications are numerous signal and safety devices for protection of equipment, but these are not perfected to the point where they are wholly dependable. We are attempting to secure maximum performance and availabil-

Typical Minnesota open-pit iron mine using truck transportation

ity at the lowest cost. Previously developed schedules of periodic maintenance do not protect us adequately, and we want to avoid excessive expenditures for maintenance parts and labor.

These problems are all a part of the never ending effort to get more work done, faster, and at a lower cost, but it can safely be said that trucking has been one of the most rapidly perfected developments in the history of iron mining, having reached its present advanced state in the short period of 15 years.

Overhaul at Mine

Truck maintenance practice on the Iron Ranges has advanced to the point where most operators do all of their overhaul work, minor and major, on all of the mechanical components, including engines. In addition, special repair space and equipment is provided for overhaul of engines, transmissions, clutches, differentials and rear axles, and for fuel pump repairs. An increasing number of operators are providing engine dynamometers for engine run-in, fuel adjustment and horsepower check. These devices pay for themselves in a short time and eliminate a lot of guesswork.

It is general practice to make minor and running repairs at garages in or close to the pits, with major overhauls and specialty work at central or headquarters garages. Exceptions are necessary when the major work is too great to handle at headquarters, or when restrictions in the use of public highways prevents the movement of heavy equipment.

Automotive maintenance among the large operators is generally segregated between off-highway and highway equipment, each being handled in its own department. Among small operators this work may be combined. Off-highway maintenance will usually include all off-highway trucks, track laying and rubber tired tractors, graders, large and small sprinklers, mobile cranes, flat bed trailers, fuel trucks, gasoline or diesel-powered air compressors, welders, lighting plants, exploration drills and pumps; engines, clutches and converters from gas or diesel-powered shovels and railroad cranes where used; and specialty equipment such as the Gradall unit used for cleaning truck bodies, ditching and miscellaneous clean-up work.

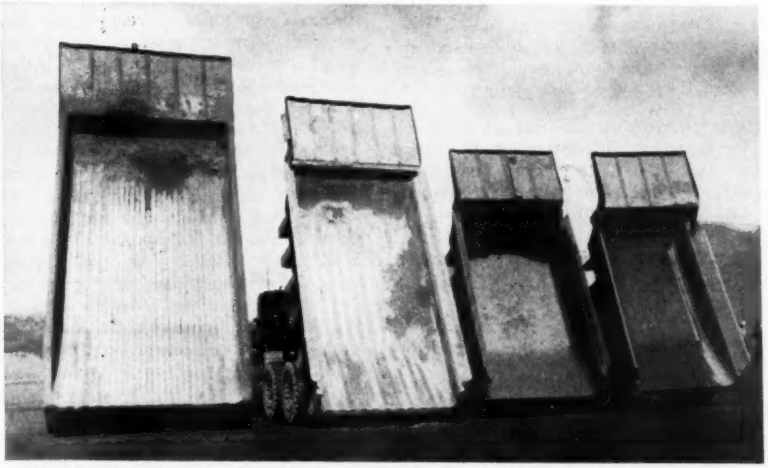
Larger trucks and shovels result in lower operating costs and a changing maintenance problem

Combination office, truck repair garage and shops at Mesabi Range open-pit mine can handle largest trucks

Winter Poses Problems

Certain design features of our off-highway truck equipment are dictated by severe climatic conditions. The average mean yearly temperature is 39 deg F., but ranges from a maximum of 110 deg F. to a minimum of 50 deg F. below zero. Work continues between these extremes. Changes in oils and engine coolants and temperature controls, with related cab temperature conditions and driver comfort, are very important winter maintenance problems. The use of exhaust heated bodies to prevent freezing of material to the bodies, has introduced new problems in body design and upkeep.

As equipment sizes have gone up, there have been corresponding increases in the size and capacity of the electrical starters, generators, batteries and accessories required. This has grown to a point where the initial investment in accessories and the upkeep have become excessive and out of line. Substantial reductions in both of these have resulted from a change to air starters, for the large diesel engines, and to relatively small 6 or 12-volt generators and batteries to handle the accessory and lighting load. Field operation also has conclusively demonstrated the benefits of installing the electrical wiring on trucks in thin-walled, flexible conduit. We are currently working to have this done initially at the factory. This will eliminate another troublesome maintenance problem that causes delays while field electricians are trying to locate flying faults and stray grounds in cable harnesses that can cause so much trouble in involved electrical layouts.



Trend in truck sizes is shown by change from 15 to 50 tons capacity in ten years

Tires Costly Item

Tires are a costly maintenance item. As truck sizes, weights and payload capacities have gone up, tire performance has come down relative to past experience, perhaps due to overrating of tire capacities by the truck manufacturers. While this is ordinarily permissible and economical, it can be overdone, and relative cost figures on a ton-mile-elevation comparison show that recent tire costs are higher. Weather and operating conditions are large factors in this problem, and our over-all tire bill reflects the unusually wet summer and fall season of last year and this year's weather to date.

This condition emphasizes the importance of maintaining mine roads in good condition the year round.

Most companies do their own tire mounting and dismounting and make their own tube repairs. Tire repairs and recapping are done by several Range tire agencies located conveniently to the field. One company is completely equipped to do all of its tire work, except recapping, and has found it successful and economical. Recapping is general practice, but experience shows that recapping will not always be practical or economical.

Exchange Information

A recent and very important addition to the maintenance picture on the Iron Range has been the formation of a Range Mechanical Committee which meets monthly to discuss maintenance problems, exchange maintenance ideas; report on and tabulate the record of failures on designated components on all makes and models of trucks in use on the Range; and to meet and discuss truck weaknesses with manufacturers' representatives. It is also the committee's intention to invite specialists in various related lines such as fuel, lubrication, converters, etc., to come to these meetings to discuss field problems.

Spacious indoor storage facilities protect rolling stock from weather at Minnesota open-pit mine

Membership is open to maintenance men from all companies using automotive equipment, and the number from each company is in proportion to the number of units of such equipment. The dinner meetings are held in the evenings, alternating between two principal Range towns, and the minutes and the findings are reported to the management of each participating company. Although new and still somewhat in the formative stage, the meetings to date have been well attended, informative and lively, and potentially will be of great value to the industry.

Maximum Extraction in First Mining

United No. 1 Keeps Loading Machines Working 51.5 Percent of the Time to Produce 17.4 Tons-Per-Man-Day For the Entire Mine

By M. H. SHUMATE
Assistant General Manager
Traux-Traer Coal Co.

RISING labor rates and supply costs, coupled with static or declining realization, have resulted in the recent emphasis on newer types of machinery and on the investigation of techniques for their efficient use in coal mining. These include continuous mining machines, coal planners, the various European long face machines and large auger units.

No one interested in coal's long term prosperity would minimize the importance of efforts to promote, invent, develop and use new machinery. Indeed, there is no escaping the conclusion that coal must continue to expand its financial support of research and development programs if it is to survive as a prosperous major industry.

Nevertheless, without minimizing the importance of new equipment, the industry must utilize what it has with full effectiveness. The point is that utilization of fixed plant and movable equipment may be improved profitably at the cost of a little intelligent study. Take as an example a company with a large and efficient central cleaning plant; could such a company, in developing new mines and tonnage sources, afford to neglect the economies of contour mining and short life underground mines?

The industry, then, can recognize these objectives:

(1) The constant search for new machinery and methods to keep the coal mining vital and profitable.

(2) The most efficient use of present machinery so that today's production can pay for tomorrow's new equipment.

It is with the second of these objectives that this paper deals. It describes what has been done at one property to lower costs, help recovery and make the mine a steadier and safer producer. All the machinery at the mine was and is standard and routine; the mining system was and is room and pillar. Only in the functioning of the units, in organization, in mining plan layout dimensions and in a few purchases of control "gadgets," have changes been made at the United No. 1 Mine of the Truax-Traer Coal Co., West Virginia Division, Kanawha County, W. Va. Opened in 1949, and served by the Chesapeake and Ohio Railroad, most of the coal produced is sent to the Central Washington Plant at Ceredo, W. Va., for preparation and final shipment. Because of relatively low inherent ash and sulphur content, more than 80 percent of the production is marketed as metallurgical coal, the remainder as high quality steam coal.

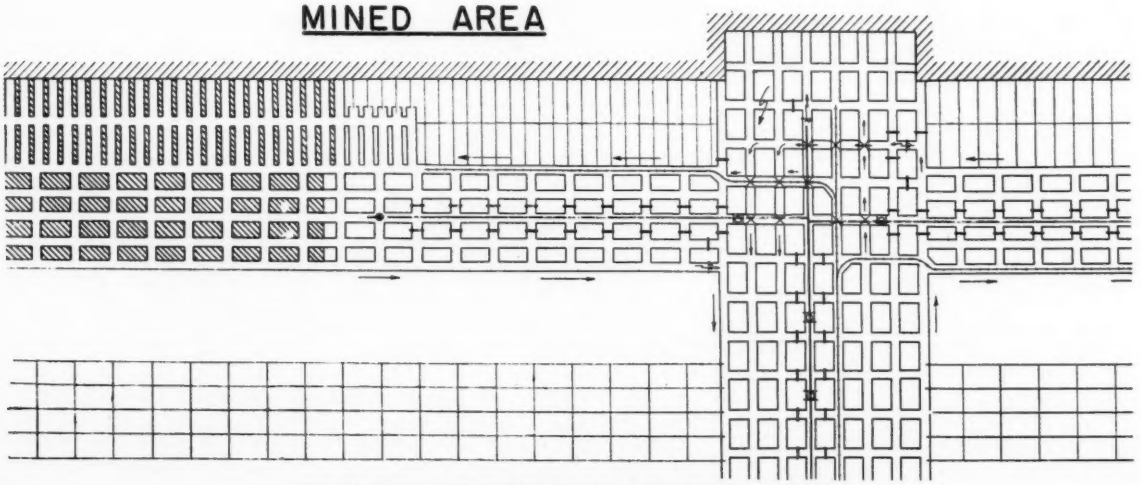
Seam Averages 66 In.

The No. 2 Gas seam at United is in general well suited to mechanical mining. The seam dips to the northwest an average of two percent, very few heavier local grades being encountered. Where the seam is clean, it varies from 54 in. to 72 in. thick, averaging 66 in. It is often separated into two nearly equal branches of good coal by a middle slate band, 1 to 24 in. thick. Mining the middle band when it is over 18 in. thick is always unprofitable, and mining when the band is thicker than 12 in. results in decidedly lower production. Consequently, very little mining has been done where the middle band is more than 12 in. thick.

All coal haulage from shuttle cars to outside is by 30-in. belt conveyors, with Jeffrey and Barber-Greene frames, running 400 to 525 fpm.

Undercutting and shearing, when done, is the task of Joy 11-RU machines, while coal drilling is done with hand-held Jeffrey A-7 drills carried on the cutting units. Joy 14-BU loaders are employed, loading into Joy 5-SC cable reel shuttle cars.

Because of variations in seam and place conditions, center partings, and



Plan of mining at United No. 1 mine of the Truax-Traer Coal Co.

No single set pattern is used for face preparation

roof, cutting and drilling conform to no single set pattern but is adjusted to the requirements of each place.

All shooting of coal is done with DuPont Lump Coal "C."

Roof bolting equipment consists of Joy rubber-tire mounted compressor, Le Roi Cleveland short stopers, Chicago Pneumatic impact wrenches and Brownie dust collectors. All drilling is done dry.

A unit or section face crew consists of one loader-operator, one loader-helper, two cutters, one shot-firer, two shuttle-car operators, two or three timbermen or roof-bolters and one boom man. Thus, the crew may total 10 or 11 men, depending upon existing conditions and timbering requirements; there is also a certified foreman in charge of each crew.

Two Producing Shifts

The mine operates three shifts daily —producing coal on the first two, while the midnight shift crews are responsible for machinery and general mine maintenance, conveyor moves, supplying, rock-dusting, etc. The men employed are classified:

4 Sectional Crews	42
Machinery Maintenance ..	8
Rock Dust Crew	4
Supply Crew	5
Belt Conveyor Operation and Maintenance	6
General Inside Labor	5
Outside Labor	8
Supervision	8
Total—Three Shifts....	86 Men

Mining Plan

This mine is developed by eight main headings driven 18 ft wide on 60-ft centers with crosscuts on 80-ft centers. Panel or butt entries are turned right and left off the mains in sets of five headings 18 ft wide on 50-ft centers with crosscuts on 80-ft centers. Rooms 200 ft deep by 20 ft wide are driven in sets of five on 30 or 40-ft centers depending on local mining conditions.

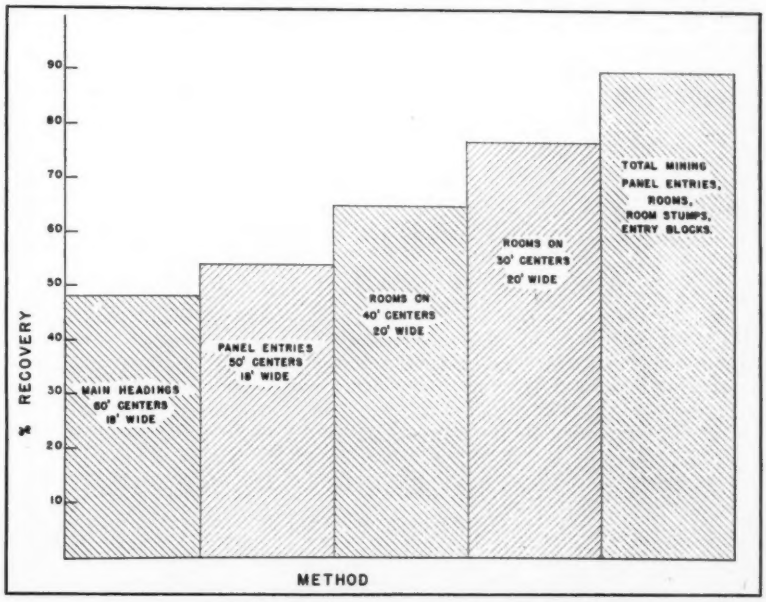
Each panel is 400 ft wide and 1500 to 2500 ft long. Panel entries are driven to the outcrop or property boundary, usually without driving any rooms. Pillar extraction begins only after panel entries have been developed and the first group of rooms driven up. Five rooms on 30-ft centers make the room development unit; they start and finish together. When a room unit is completed, room pillars are then mined back immediately. Room pillars are 10 ft wide and 75 ft long when rooms are on 30-ft centers. Entry chain pillars are 32 ft wide and 62 ft long.

Room pillars are mined by leaving a small stump of coal between the gob and working area. Three or four rows of breaker posts are set in the gob area, and a row of posts on 6-ft centers are set in the middle of the room. The machine makes a slab cut 60 ft long. Safety posts are set on 6-ft centers as the cutting machine pulls back. Stumps are partly recovered if permitted by the roof condition. The mining of a group of five room pillars is completed before mining is started on the equivalent entry blocks.

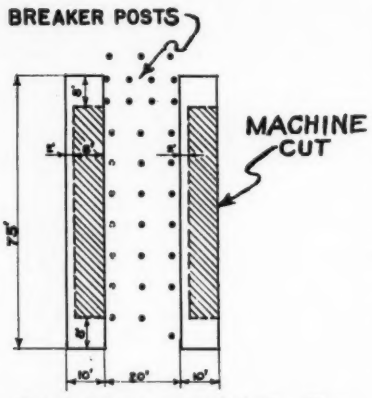
If roof conditions are good, stumps will be partly recovered. As the last blocks are mined a new set of rooms is developed and haulage roads are established so as to maintain a steady flow of production. In some instances after several banks of rooms are mined, weight from the overburden allows the mining of complete sets of rooms and blocks with very little cutting and shooting. The recovery of coal for a panel varies with the natural conditions, but normal extraction for the various phases of mining are indicated in Figure 3.

Belts For Main Line Haulage

From the face to belt conveyor loading points, coal is hauled by rubber-tired cable reel shuttle cars. Shuttle car travel is limited to 375 ft one way. Cars discharge their loads into hoppers built over the belts. The hopper has a grid with 12-in. square openings. It is the duty of the boom man to work all material through these grids, loading the belt uniformly, reducing excess spillage and protecting belting.



Recovery varies from section to section but averages 88 percent



Sixty-ft slab cuts are made in the pillars on retreat, leaving a small fender and 8-ft stumps for protection

Panel belts are heavily loaded due to the shuttle cars' high rate of discharge. Panel belts discharging onto the main conveyor are controlled automatically by Ensign Electric Belt Hesitators installed near the drive unit. Two hesitators are connected in parallel with each other and in series with No. 4 belt conveyor control circuit. Consequently, if both panel belts have surge loads at the same time, No. 4 will stop until No. 3 has discharged its load. Then No. 4 will restart. The hesitator is adjusted to operate when extra heavy loads cross the troughing idler attached to the mechanism, at which time the counter weight is raised and the mercury switch opens the circuit.

If both panel belts have a surge load together, both circuits will be opened and No. 4 conveyor will stop, allowing No. 3 conveyor to discharge its load, and as the weights drop down, the mercury switch will close the circuit, starting the other belt. The control circuit along each conveyor has switches conveniently located 200 ft apart for emergency purposes.

Controls Are Interlocked

For interlock control, each conveyor has a centrifugal switch connected in series with its control circuit, but operated by the belt to which it discharges, i.e., the belt in front of it. Should the belt in front stop, all belts behind also stop. Centrifugal switches are normally open but as the belts reach a speed of 300 fpm, the switch and circuit closes. No. 1 belt operates the centrifugal switch which is connected in series with the control circuit for No. 2 belt, and the No. 2 belt has two centrifugal switches mounted on it near its tail piece. These are each connected in series with control circuits of No. 3 and No. 4 belts. At the discharge of No. 2 conveyor there is a paddle controlled mercury switch. When the paddle hangs perpendicular the circuit is closed, allowing the belt to operate. If excess spillage raises the paddle, all belts stop until the spillage is cleaned up. All centrifugal switches have manual switches on shunt circuits to permit independent conveyor operation when necessary.

While all coal is conveyed on belts to the tipple, all supplies and equipment are hauled to the sections on 40-lb, 42-in. gauge track, with overhead trolley. On development, this track is laid up close to working sections. The track is also a material contribution to the dc power distribution system.

Control Dust

Water sprays are located at belt heads, sectional loading points, and wherever there is an air restriction in the belt entry for ventilation purposes. Sprays are also mounted on the cutting machines and loading machines. Water line pressure is maintained between 70 and 90 psig; the four-in. main is laid in the same entry as the mother conveyor. Two-in. branch lines on each panel entry serve sectional loading points and face connections. Sectional distribution is by ¾-in. pipe and rubber hose.

Sprays at shuttle car unloading hoppers are controlled automatically by magnetic valves connected in conjunction with the belt hesitator and belt control circuit. When the belt is empty, the weight on the hesitator is down and a Joy tram pedal switch is opened, stopping the spray (the tram pedal switch being reversed so counter weight pressure opens the circuit). When the belt conveyor is only partially loaded the weight raises sufficiently to allow the tram pedal switch to close and again start the sprays. Power to operate the magnetic valves is obtained from the belt control circuit; if the belt is stopped, the spray also stops. This method of spray control avoids excess water at spill points and should increase belt life.

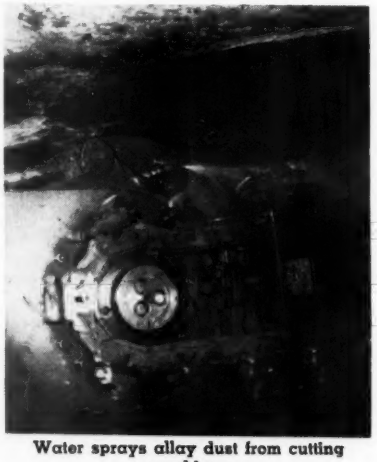
Split Air Four Ways

A four-ft axial flow exhaust fan circulates air at the rate of 65,000 cfm. Four main splits of air, three for operating sections and one for the entry that contains the belt conveyors, ventilate the mine. The inside substation is ventilated on a separate small split of air. All stoppings are constructed of cinder blocks and plastered on the pressure side to prevent leakage. An average of four block and steel overcasts are required for each new panel turned off the mains. Face ventilation is directed and controlled by check curtains and line brattice, made in all cases of standard brattice cloth.

Convert Power Underground

Purchased power is 4160 v, 3 phase, 60 cycle ac. The high voltage three conductor cable is carried underground in a separate intake airway to a 300 kw mercury arc rectifier housed in a fire-proof building and ventilated on a separate split of air. The rectifier is equipped with all the usual protective devices, including overload, phase failure and automatic reclosing.

Underground dc power distribution circuits use the trolley wire and feeder line combined for the positive. Current is returned through the supply track which is banded with 4/0 copper and cross bonded at 200-ft intervals. Feeder lines in main entries consist of 1,000,000 cir mils bare stranded conductors; those in the panel entries are 500,000 cir mils. All feeder lines are carried in the supply track entry. The 4/0 trolley wire is



Water sprays allay dust from cutting machines

All roof drilling is done dry with dust collectors

parallel with the dc feeder; connections between the two being made at 300-ft intervals. Mobile face equipment is served by trailing cables connected to the 500,000-cir mils feeder through fused nips and General Electric 200-1000-amp circuit breakers that are reset manually. Cutting machines are equipped with No. 1, and loading machines and shuttle cars with No. 4 trailing cables. New cables are always first installed on shuttle cars. Only repaired vulcanized cables are used on loading machines. All belt-conveyor drives are 250-v dc.

Face Practices Improved

What has been the objective at United No. 1 Mine? Plainly and simply, and certainly not uniquely, the primary effort has been to decrease costs. In this management had considerable success, and found that the measures taken to make production efficient also resulted in a better safety record, improved extraction, and better housekeeping.

Without question, much of the improvement in cost resulted from better face practices. Some of these were:

(1) Insistence on a strict cycle and a sufficient number of working places.

(2) Establishing standard procedures for cutting, drilling and shooting of each place, according to local conditions, so that in practically all places falls of coal are of maximum loadability.

(3) Establishment and maintenance of short, direct, non-conflicting shuttle car routes from face to belt loading points.

(4) Adjustment of room centers to local conditions and territory boundaries. In general, with short rooms up to 200 ft, pillars only 10 ft wide give no trouble because they are brought back immediately after the rooms are driven. Adjacent gob areas give little trouble, in fact often help recover the pillars without cutting or shooting.

(5) The training of all crew members into an efficient team, each knowing and performing his duties efficiently with a minimum of supervision. This sounds easy, but it required good human material to start with, together with hard intelligent work by the unit bosses and their supervisors.

(6) A program of regular checks on equipment and preventive maintenance to reduce mechanical breakdowns on shift to a minimum.

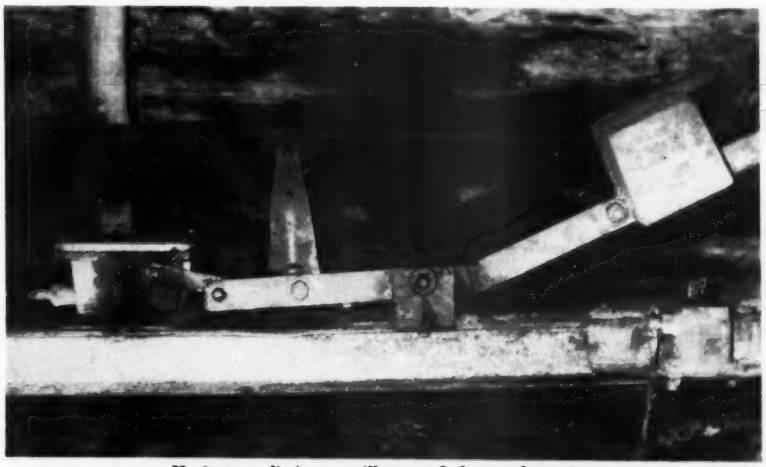
Formerly, manual control of belts and sprays was practiced. Only a small expenditure for switch units and a moderate amount of shop and mechanics' time was needed to make these controls automatic. In operation they have proved reliable and almost fool-proof. Manual control was not. Spillage due to overload on belts has been practically eliminated, as have pile-ups at discharge points. Sprays which operate only when needed have eliminated the dust hazard without the mess caused by excessive water. All these result in less clean-up labor.

With sections on strict cycle, it has been found that the men work at a considerably steadier pace—without spells of standby or loafing at one extreme, or rushes of activity at the other. Such a steady pace contributes to more reasoned actions and better safety for face men.

It has been found that, on the average, extraction has not been materially different than when all second mining was of 32-ft by 62-ft blocks. And timbering and clean-up expense is considerably less. It is the opinion of the management that single paneling, the driving of rooms only on the inby side of panel entries, has contributed materially to the good recovery so far experienced.

In conclusion, a few figures may be of interest:

Tons for all men, including supervision	Per day 1500
Tons per face man	35.8 percent
Recovery average to date	88 percent
Percent — Working time, loading machines operated	51.5 percent
Percent — Working time, cutting machines operated	55.0 percent
Percent — of mechanical breakdowns	8.8 percent



Hesitators eliminate spillage at belt transfer points

Manual-reset circuit breakers protect mobile face equipment

1953 Coal Show

Plans Fall into Line As Cleveland Gets Ready for Big Event

R. E. SALVATI
National Chairman Program Committee

LESS than two months remain before the 1953 Coal Show. More and more of the thousand-and-one things that go into a smooth-running, successful convention and exposition are falling into place. The fine work of the Program Committee is reflected in the Advance Program printed below. On the theory that tomorrow's plans are best built on the solid foundation of the experience of yesterday and today, speakers well versed in their fields will report on the latest advances in deep and strip mining as well as coal cleaning and the problems of management. A reading of the Advance Program itself will indicate the caliber of the men and the scope of the topics on which they will speak.

More than 230 manufacturers of machinery and suppliers of the tools and equipment needed to implement the mining of coal the modern way have been hard at work planning the displays that will make up the Exposition. They will be ready by May with the biggest showing ever of mining and processing equipment and supplies.

Cleveland Auditorium's huge ex-

(Continued on page 43)

Advance Program

MONDAY—MAY 11

10:00 am—Opening Session—Roof Support and Pillar Recovery

A Summary of Roof Bolting Developments—Speakers from three fields will describe their roof bolting techniques, the drilling equipment, the character of strata encountered and the results.

E. R. Cooper, General Manager of Coal Mines, Jones & Laughlin Steel Co., Pittsburgh.

J. C. Hunter, Manager, Powellton Coal Co., Mallory, W. Va.

Herman E. Knight, Division Engineer, Bell & Zoller Coal Co., Madisonville, Ky.

Pillar Extraction Under Heavy Cover—A detailed account of the physical characteristics of the seam and overburden with a mining plan showing entry development and final recovery.

R. F. Bowie, Research & Planning Engineer, Union Pacific Coal Co., Rock Springs, Wyo.

Pillar Extraction in Anthracite Mining—A description of the operating method and machines making a high coal recovery under roof conditions more or less typical of the anthracite field.

R. M. Van Storch, Superintendent, Hudson Coal Co., Plymouth, Pa.

TUESDAY—MAY 12

10:00 am—Mechanical Mining Session

Maximum Extraction in First Mining—A room and pillar system with trackless equipment averages less than 9 percent lost time from breakdowns and makes an 88 percent coal recovery.

Mack H. Shumate, Assistant General Manager, Truax-Traer Coal Co., Kayford, W. Va.

Mechanical Mining in Thin Seams—Two speakers from widely separated fields and under different seam conditions will describe their operating methods with conventional mechanical loaders.

Frank Badda, General Superintendent, Northwestern Improvement Co., Roslyn, Wash.

W. J. Shields, Assistant Chief Mining Engineer, Rochester & Pittsburgh Coal Co., Indiana, Pa.

Specifications for Efficient Face Preparation—Dealing with both full seam and selective mining, this paper will discuss practices and equipment for cutting, drilling, blasting, timbering, face ventilation and coal dust control.

Emmett T. Lang, Industrial Engineer, Powhatan Mining Co., Powhatan Point, Ohio.

10:00 am—Safety Session

Degasification of Coal Seams—A progress report on experiments to determine the practicability of drilling in advance of mining to extract methane from a coal seam and its adjacent strata.

G. R. Spindler, Director, School of Mines, West Virginia University, Morgantown, W. Va.

Coal Dust Sources and Control Underground—A discussion on how and where coal dust is created underground and what methods can be used to prevent such dust from becoming airborne.

James Westfield, Chief, Health & Safety Division, U. S. Bureau of Mines, Washington, D. C.

Causes and Prevention of Coal Mine Bumps—An account of a field investigation to determine what conditions of overburden and extraction cause coal mine bumps and a study of preventive measures.

Charles T. Holland, Head, Department of Mining Engineering, Virginia Polytechnic Institute, Blacksburg, Va.

H. E. Mauck, General Superintendent, Olga Coal Co., Coalwood, W. Va.

2:00 pm—Strip Mining

Coal and Overburden Haulage—A panel discussion to show present practices and trends in coal transportation from the pit and overburden removal with various types of equipment.

F. W. Chesney, President, Shen-Penn Production Co., Shenandoah, Pa.

R. C. Gessel, Field Engineer, R. G. LeTourneau, Inc., Peoria, Ill.

E. E. Howard, Special Representative, Caterpillar Tractor Co., Peoria, Ill.

A. S. McClimon, Manager Sales Development, Euclid Road Machinery Co., Cleveland, Ohio.

Ralph H. Kress, Dart Truck Co., Kansas City, Mo.

Bucket and Dipper Trends—A panel discussion covering new and improved methods and equipment for handling overburden and for coal loading.

Jas. D. Reilly, Vice-President, Hanna Coal Co., St. Clairsville, Ohio.

A. F. Busick, Vice-President Engineering, Marion Power Shovel Co., Marion, Ohio.

R. M. Dickey, Manager Machinery Sales, Bucyrus-Erie Co. South Milwaukee, Wis.

P. V. Larsen, Chief Engineer of Construction, Electric Steel Foundry Co., Portland, Oregon.

C. J. Polinek, Assistant to President, Page Engineering Co. Chicago, Ill.

Karl Schneider, Design Engineer, Harnischfeger Corp., Milwaukee, Wis.

WEDNESDAY—MAY 13

10:00 am—Management Session

Fifty Years of Handling Labor Disputes—In the anthracite industry, the Board of Conciliation has made an impressive record—its decisions have always been accepted by both management and the union.

Dr. Thos. E. Larkin, Umpire, Anthracite Board of Conciliation, Buck Hill Falls, Pa.

Central Management Vs. Unit Supervisory Control—A subject of great interest to companies operating several mines under one ownership is discussed by a speaker with a long successful background of managerial experience.

Paul Weir, President, Paul Weir Co., Chicago, Ill.

Stream Sanitation Problems in the Ohio River Valley—Members of the Coal Industry Advisory Committee will explain how the industry is cooperating with the Ohio River Valley Water Sanitation Commission to alleviate stream pollution.

E. R. Price (Chairman), Manager Coal Properties, Inland Steel Co., Wheelwright, Ky.

H. F. Hebley (Secretary), Research Consultant, Pittsburgh Consolidation Coal Co., Pittsburgh, Pa.

J. J. Foster, Vice-President, Island Creek Coal Co., Huntington, W. Va.

James Hyslop, President, Hanna Coal Co., St. Clairsville, Ohio.

W. L. McMorris, Manager Coal Preparation, Coal Division, U. S. Steel Corp., Pittsburgh, Pa.

L. E. Sawyer, Director of Reclamation, Indiana Coal Producers Association, Terre Haute, Ind.

10:00 am—Haulage and Power Session

High Capacity Track Haulage—Two speakers will cover modern underground rail haulage systems including track construction, rolling stock, operating methods, dispatching and safety devices.

D. H. Davis, Vice-President, Mathies Coal Co., Finleyville, Pa.
Frank La Roche, Superintendent, Snow Hill Coal Corp., Terre Haute, Ind.

A Complete Belt Mine—These papers will describe all-belt installation, operation and maintenance, automatic controls and fire protection, as well as methods of handling men, supplies and equipment in and out of the mine.

Jos. Craggs, Ass't Division Supt., Peabody Coal Co., Taylorville, Ill.

H. A. Jones, General Superintendent, Carbon Fuel Co., Carbon, W. Va.

Reversed Polarity for Mine Circuits—Based on wide experience, this presentation will outline the advantages and disadvantages of positive and reversed polarity explaining how each method operates, and its effect on corrosion.

Howard B. Buckingham, Electrical Engineer, Tennessee Coal & Iron Division, U. S. Steel Corp., Fairfield, Ala.

Elton L. Parker, Mining Section, Westinghouse Electric Corp., East Pittsburgh, Pa.

2:00 pm—Strip Mining

A Symposium on Highwall Drilling—Speakers from several fields will describe methods and equipment for operating in hard and soft strata and in various depths of overburden.

General Problems:

Fred Horne, Chief Blasting Engineer, Sinclair Coal Co., Evansville, Ind.

Horizontal Drilling:

Marlin Carter, Superintendent of Drilling and Blasting, Ayrshire Collieries Co., Winslow, Ind.

Merle Busby, Drilling Superintendent, Ozark-Philpott Mine, Ozark, Ark.

Vertical Drilling:

Robert Akre, Superintendent of Drilling and Blasting, Maumee Collieries Co., Linton, Ind.

G. H. Utterback, Chief Engineer, United Electric Coal Cos., Chicago, Ill.

THURSDAY—MAY 14

10:00 am—Continuous Mining

A Review and Forecast of Continuous Mining—A brief resume of present operations will be followed by a discussion of cost reductions already realized and additional savings possible in a wider field of application.

M. H. Forester, Vice-President, Pittsburgh Consolidation Coal Co., Pittsburgh, Pa.

H. B. Wickey, Vice-President, Pennsylvania Coal and Coke Corp., Cresson, Pa.

Continuous Haulage for Continuous Mining—This important auxiliary operation will be covered by speakers who will deal with several types of service haulage equipment, including a mobile conveyor and a tractor mounted shuttle car.

W. B. Jamison, Vice-President, Jamison Coal & Coke Co., Greensburg, Pa.

James D. Sutton, Electrical Engineer, Clearfield Bituminous Coal Corp., Indiana, Pa.
Other speaker to be announced.

Remotely Controlled Bore Mining—A novel and spectacular machine designed for a special service may prove to be the forerunner of future developments extending this idea to other coal mining fields.

P. L. Alspaugh, Manager Coal Utilization Projects, Carbide & Carbon Chemicals Co., Charleston, W. Va.

10:00 am—Coal Preparation

Mine Operating Factors That Affect Coal Preparation—Factors outside of seam characteristics, such as continuous mining, crushing, coal storage and three-shift operation, must be considered in the design of a coal cleaning plant.

R. L. Llewellyn, Preparation Engineer, Eastern Gas & Fuel Associates, Pittsburgh, Pa.

Anthracite Fine Coal Cleaning at Coaldale Plant—This description of best practices in anthracite preparation will give special attention to provisions for sludge and dust recovery.

W. T. Turrall, Supervisor of Preparation, Lehigh Navigation Coal Co., Lansford, Pa.

Bituminous Fine Coal Cleaning in West Virginia—As this account of a modern preparation plant will illustrate, fine coal recovery is profitable and serves to prevent stream pollution.

Mathew Turkovich, Supervisor of Preparation, Island Creek Coal Co., Holden, W. Va.

Coal Preparation With New Type Heavy Media Operation—An outline of the plant layout will be accompanied by a discussion of the problems encountered, with performance figures.

J. B. Taggart, Vice-President, Wise Coal & Coke Co., Dorchester, Va.

Members—Program Committee

I. N. Bayless
Union Pacific Coal Co.

R. K. Beacham
Fairview Collieries Corp.

S. M. Cassidy
Consolidation Coal Co. (Kentucky)

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Marion Power Shovel Co.

M. B. Crowley
Caterpillar Tractor Co.

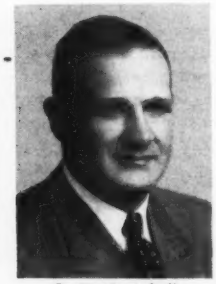
F. W. Earnest
Anthracite Institute

Harrison Eiteljorg
Morgan Mines, Inc.

Milton H. Fies
Alabama Power Co.

Harry L. Gandy
Elk River Coal & Lumber Co.

A. G. Gossard
Snow Hill Coal Corp.



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Atlas Powder Co.

John Graham
American Steel and Wire Div. U. S. Steel Corp.

Alex Grant
Buckeye Coal Co.

Cecil M. Guthrie
Sinclair Coal Mining Co.

R. W. Hernlund
Western Machinery Co.

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C. O. Kane
Armco Steel Corp.

J. C. Keplinger
Hercules Motors Corp.

F. P. Kerr
Eastern Coal Corp.

Hugh B. Lee
Maumee Collieries Co.

(Photos not available)

E. E. Jones
Winding Gulf Collieries

L. F. Lumaghi
Lumaghi Coal Co.

T. F. McCarthy
Clearfield Bituminous Coal Corp.

H. C. Livingston
Traux-Traer Coal Co.

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Forest J. Nelson
Macwhyte Co.

Frank Nugent
Freeman Coal Mining Corp.

H. H. Pancake
American Car & Foundry Co.

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R. G. Pfahler
Berwind-White Coal Mining Co.

James Reilly
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S. F. Sherwood
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Carbon Fuel Co.

J. E. M. Wilson
The Jeffrey Mfg. Co.

W. A. Wirene
General Electric Co.

Exhibitors...

1953 COAL SHOW

Here's the initial list of manufacturers who will make the 1953 Coal Show the greatest exhibition of mining machinery, equipment and supplies ever held

Acme Machinery Co.
Aeroquip Corp.
Aero Service Corp.
Ahlberg Bearing Co.
Alemite Division
Stewart-Warner Corp.
Allis-Chalmers Mfg. Co.
General Machinery Division
Allis-Chalmers Mfg. Co.
Tractor Division
American Air Filter Co.
American Brattice Cloth Corp.
American Car & Foundry Co.
American Chain & Cable Co., Inc.
American Cable Division
Hazard Wire Rope Division
American Cyanamid Co.
American Manganese Steel Division
American Brake Shoe Co.
American Mine Door Co.
American Wheelabrator & Equipment Corp.
Anaconda Wire & Cable Co.
Armco Drainage & Metal Products, Inc.
Ashland Oil & Refining Co.
Atlas Powder Co.
Austin Powder Co.

Baker-Raulang Co.
Baldwin-Lima-Hamilton Corp.
Construction Equipment Division
Barber-Greene Co.
Bearing Service Co.
Bemis Bro. Bag Co.
Bethlehem Steel Co.
Bird Machine Co.
Bituminous Coal Institute
Bixby-Zimmer Engineering Co.
Blackhawk Mfg. Co.
Boston Woven Hose & Rubber Co.
Bowdil Co.
Bowers Battery & Spark Plug Co.
Broderick & Bascom Rope Co.
Brown-Fayro Co.
Bucyrus-Erie Co.
Buda Co.
Burndy Engineering Co., Inc.

Calcium Chloride Institute
Carboloy Department of General Electric Co.
Cardox Corp.
Carlon Products Corp.
Caterpillar Tractor Co.
Centrifugal & Mechanical Industries, Inc.
Chain Belt Co.
Chicago Pneumatic Tool Co.
Cincinnati Mine Machinery Co.
Cities Service Petroleum, Inc.
Clarkson Mfg. Co.
Cleveland Worm & Gear Co.
Coal Age
Coal Mine Equipment Sales Co.
Coal & Mineral Washer Corp.
Coffing Hoist Co.
Colorado Fuel & Iron Corp.
Wickwire Spencer Steel Division
Combustion Engineering-Superheater, Inc.
Flash Dryer Division
Compton, Inc.
Connellsville Mfg. & Mine Supply Co.
Cummings, Jr. & Associates, Robert A.
Cummins Engine Co., Inc.

D-A Lubricant Co., Inc.,
Dart Truck Co.
Davis Co., Nelson L.
Deister Concentrator Co.
Deister Machine Co.
Deming Co.
Denver Equipment Co.
Detroit Diesel Engine Division
General Motors Corp.
Differential Steel Car Co.
Dings Magnetic Separator Co.
Dodge Mfg. Corp.
Dooley Brothers
Dorr Co., Engineers
Dowty Mining Equipment, Ltd.
Duff-Norton Mfg. Co.
Du Pont de Nemours & Co., Inc., E. I.

Electric Controller & Mfg. Co.
Electric Steel Foundry Co.
Electric Storage Battery Co.
Elreco Corp.
Ensign Electric & Mfg. Co.
Enterprise Wheel & Car Corp.
Euclid Road Machinery Co.
Fairmont Machinery Co.
Farmers Engineering & Mfg. Co.
Farval Corp.
Fletcher & Co., J. H.
Flexible Steel Lacing Co.
Flood City Brass & Electric Co.
Foote Bros. Gear & Machine Corp.
Freedom-Valvoline Oil Co.
Frontier Bronze Co.
Fulton Bag & Cotton Mills

General Electric Co.
Apparatus Sales Division
Construction Materials Division
Electronics Division
General Equipment & Mfg. Co.
Goodman Mfg. Co.
Goodrich Co., B. F.
Goodyear Tire & Rubber Co., Inc.
Gorman-Rupp Co.
Gould-National Batteries, Inc.
Gulf Oil Corp.
Gundlach Machine Co., T. J.
Gustin-Bacon Mfg. Co.

Hamilton Rubber Mfg. Corp.
Harnischfeger Corp.
Helwig Co.
Hendrick Mfg. Co.
Hendrix Mfg. Co.
Hercules Motors Corp.
Hercules Powder Co.
Hewitt-Robins Incorporated
Heyl & Patterson, Inc.
Holmes & Bros., Inc., Robert
Hough Co., Frank G.
Hunslet Engine Co., Ltd.

Insulation & Wires, Inc.
International Harvester Co.
Interstate Equipment Division
Yara Engineering Co.
Irwin Foundry & Mine Car Co.
I-T-E Circuit Breaker Co.

Jeffrey Mfg. Co.
Johns-Manville Sales Corp.
Jones & Laughlin Steel Corp.
Joy Mfg. Co.

Kanawha Mfg. Co.
Kennametal Inc.
Kensington Steel Co.
Koehring Co.
Koppers Co., Inc.

Lee-Norse Co.
Le Roi Co.
Cleveland Rock Drill Division
Leschen & Sons Rope Co., A.
LeTourneau, Inc., R. G.
Lewis Electrical Mfg. Co.
Lincoln Engineering Co.
Link-Belt Co.
Link-Belt Speeder Corp.
Long Super Mine Car Co.
Ludlow-Saylor Wire Co.

McLanahan & Stone Corp.
McNally-Pittsburg Mfg. Corp.
Macwhyte Co.
Manu-Mine Research & Development Co.
Marion Power Shovel Co.
Martindale Electric Co.
Mechanization, Inc.
Mine Safety Appliances Co.
Mining Congress Journal
Mining Machine Parts, Inc.
Mining Progress, Inc.
Mobile Drilling, Inc.
Morris Machine Works
Murphy Diesel Co.
Myers-Whaley Co., Inc.

National Electric Coil Co.
National Malleable & Steel Castings Co.
National Mine Service Co.
Nolan Co.
Northwest Engineering Co.

Ohio Brass Co.
Ohio Carbon Co.
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Hazard Insulated Wire Works Division.
Olin Industries, Inc.
Explosives Division
Oliver Corp.
Oliver Iron & Steel Corp.
Oliver United Filters, Inc.
Osmose Wood Preserving Co. of America, Inc.

Page Engineering Co.
Pattin Mfg. Co.
Penn Machine Co.
Pennsylvania Crusher Co.
Pioneer Engineering Works, Inc.
Pittsburgh Screw & Bolt Corp.
Plastex Pipe & Extrusion Co.
Post Glover Electric Co.
Precision Chain Co.
Productive Equipment Corp.
Protectoseal Co.
Prox Co., Inc., Frank
Pure Oil Co.

Quaker Rubber Corp.
Division H. K. Porter Co., Inc.

Raybestos-Manhattan, Inc.
Reich Bros. Mfg. Co.
Reliance Electric & Engineering Co.
Roberts & Schaefer Co.
Roebling's Sons Corp., John A.
Rome Cable Corp.
Rust-Oleum Corp.

S K F Industries, Inc.
Safety First Supply Co.
Salem Tool Co.
Sanford-Day Iron Works, Inc.
Schroeder Brothers
Shell Oil Co.
Simplex Wire & Cable Co.
Simplicity Engineering Co.
Socony-Vacuum Oil Co.
Solvay Process Division
Allied Chemical & Dye Corp.
Stamler Co., W. R.
Standard Oil Co., (Indiana)
Standard Oil Co. of Ohio
Star Jack Co.
Stearns Magnetic, Inc.
Superior Carbon Products, Inc.
Syntron Co.

Talcott, Inc., W. O. & M. W.
Tamping Bag Co.
Templeton, Kenly & Co.
Texas Co.
Tide Water Associated Oil Co.
Timken Roller Bearing Co.
Toledo Porcelain Enamel Products Co.
Tool Steel Gear & Pinion Co.
Trabon Engineering Corp.
Tracy Co., Bertrand P.
Triangle Conduit & Cable Co., Inc.,
Twin Disc Clutch Co.
Tyler Co., W. S.

Union Wire Rope Corp.
United Engineers & Constructors, Inc.
U. S. Bureau of Mines
U. S. Rubber Co.
Electrical Wire & Cable Department
Mechanical Goods Division
U. S. Steel Corp.
American Steel & Wire Division
Tennessee Coal & Iron Division
National Tube Division
U. S. Steel Supply Division
U. S. Steel Export Co.
Upson-Walton Co.

Van Cleef Bros., Inc.
Varel Mfg. Co.
Vascoloy-Ramet Corp.
Victaulic Co. of America

Water Neutralizing Co.
Watt Car & Wheel Co.
Wedge Bar Screen Corp.
Wedge Wire Corp.
Wellman Co., S. K.
Western Machinery Co.
Westinghouse Electric Corp.
West Virginia Armature Co.
West Virginia Steel & Mfg. Co.
Wilmot Engineering Co.
Woodwell Co., Joseph

Yardley Plastics Co.

Coal Show

(Continued from page 38)

hibit halls will be filled and there will be much equipment shown outdoors, too. Displays will feature full size machines in operation, wherever practical. Trained engineers and technicians will be on hand to explain their operation and to answer any pertinent questions visiting mining men may ask.

The Coal Show has been called a "Post Graduate Course in Coal Mining." Many companies—metal and nonmetallic mineral, as well as coal—have found this to be true and send not only representatives of top management but also, superintendents, foremen, maintenance men and miners, too. How well this pays off is evidenced by the fact that they send more men to each successive show.

Elaborate plans have been made to entertain conventioneers and their ladies. When the Cleveland Indians and the Chicago White Sox, both leading pennant contenders, play on Monday evening, May 11, there will be a special Mining Congress section in the stands. Tickets for this Major League game will be at a premium so order them early.

The Coal Miners Party on Tuesday night will be more fun than a threering circus. Dinner, dancing, and top notch entertainment will make this an evening no one will want to miss. Come early and stay late. Don't miss a single minute.

Wednesday night has been left free to allow mining folk to visit old friends and make new ones. Here is the chance to look up everyone you ever knew, swap experiences and just generally have a good time.

In the tradition established over the years, Thursday night is dedicated to the King Coal Theater Party. Get set for another full evening of superb entertainment in the Music Hall at the Auditorium. Plan now to join the crowd at the King Coal Theater. Tickets for this event, as for the others, should be ordered now.

The 1953 Coal Show will draw a big crowd and Cleveland's hotel accommodations will be taxed to the limit. Some hotels are already filled to capacity but the Housing Bureau promises comfortable accommodations for all. Requests for hotel reservations should be sent promptly to the Cleveland Housing Bureau, 511 Terminal Tower, Cleveland 13, Ohio. Those who plan to come by car should take advantage of the many fine motels in and near Cleveland. Advance reservations for these may be made direct or through the Housing Bureau.

Don't delay a minute! Plan now to be on hand for the 1953 Coal Convention and Exposition at the Public Auditorium in Cleveland May 11 to 14.

Here's PROOF OF THE

DOING THE ENTIRE JOB... WITH

84.5%

COAL RECOVERY!!

ROCK INCLUSIONS

4 BUTT ENTRIES STARTED WITH 14-BU LOADER

VERSATILITY of the JOY CONTINUOUS MINER

HERE ARE THE DETAILS:

Mine: Located in central Pennsylvania, operating in the Lower Kittanning seam.

Conditions: Considered generally fair in this section. Height of the coal was 40″ to 46″. There was no top boney. Part of the roof was sandstone, part slate. The floor was of hard fireclay nature, fairly level.

Machine Model: The Joy 3-JCM Continuous Miner.

How Used: Placed in a set of four butt entries previously started with a 14-BU Loader. The Miner completed driving the entries, mined the rooms to right and left of the entries and extracted all pillars, including the entry pillars.

Auxiliary Equipment: Two shuttle cars were used back of the Miner. They discharged the coal on a belt conveyor which, in turn, spilled the coal on another belt conveyor.

Crew: Four men—two on the Miner and two shuttle car operators. They also used a Face Boss and one mechanic on each machine shift. No man was needed at the belt head, since this belt spilled the coal directly on the main haulage belt.

Total Coal in Area: 124,916 tons

Total Coal Recovered: 105,507 tons

Recovery percentage: 84.5%

Time Span: 620 days (started Dec. 11, 1950 and finished August 22, 1952). The machine worked 771 shifts on a double shift basis.

Shift Tonnage: 136.84 tons/shift

Man Tonnage: 34.21 tons/face man, which of course included all delay time.

The versatile, powerful Joy Continuous Miner can operate in any mine it can enter. Thin seams, thick seams, split seams—all can be efficiently worked without shooting.

The mined-out section illustrated on the facing page is a typical performance. This case history is just one more of the many instances which amply prove that the Miner will do a quick, thorough job of developing entries and driving rooms, and in addition, a top-notch pillar-recovery job.

In fact, users will tell you that the Joy Continuous Miner actually is "the best machine developed to date for extracting pillars."

The 3-JCM can be furnished either 34″ or 39½″ high, and will mine from 6″ below to 66″ above bottom. The 4-JCM is available in 48″ or 53¼″ heights, and will mine from 5½″ below to 98½″ above bottom. Special equipment will permit the 3-JCM to mine to 76″ above bottom, and the 4-JCM to 120″ above bottom. A third model, the 2-WM, is available for mines operating in very low coal, handling seams as thin as 30″.

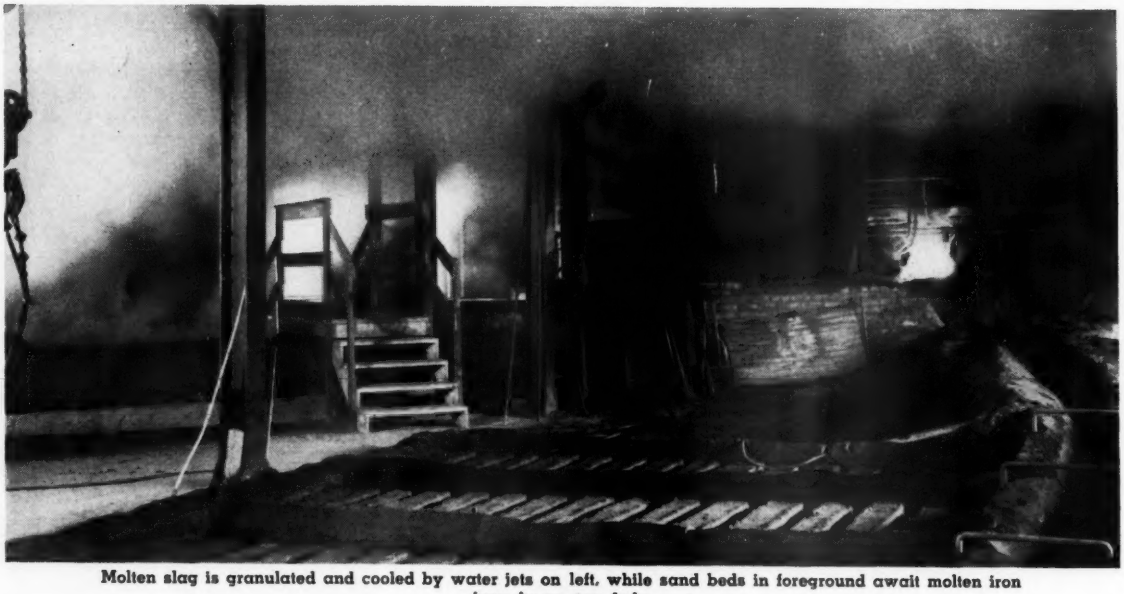
Let us show you how the Continuous Miner will fit into your operation, to give you high-production mining at absolute rock-bottom cost per ton of coal mined. ● *Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.* In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario*

Consult a Joy Engineer

JOY

WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT

WAD CI-4414



Molten slag is granulated and cooled by water jets on left, while sand beds in foreground await molten iron from lower tap hole

Further Development of the Sterling Process

With Difficulties of Zinc Smelting in Electric Arc Furnace Overcome, Commercial Application May Be Expected in the Near Future

By W. M. PEIRCE
Licensed Plant Engineer
The New Jersey Zinc Co.

IN preparing this description of the Sterling Process, the writer has drawn freely on the paper entitled "The Sterling Process," by Messrs. Handwerk, Mahler and Fetterolf, which appeared in the June 1952 issue of *The Journal of Metals*. Since that paper was written, several months of continued operation of the full sized furnace have yielded further important results.

The Sterling Process is a new method for smelting zinc ores using heat generated by an electric arc to carry on the reduction. Covering United States and foreign patents have been granted to The New Jersey Zinc Co. By the process zinc metal, together with its accompanying values, and iron are produced. All of these elements, except for a controlled amount of iron, are almost completely eliminated from the slag. The process derives its name from the fact that initially it was directed to the smelting of the crude ore from the Sterling Hill Mine of The New Jersey Zinc Co. This ore, after calcining, assays 18 to 20 percent zinc and an equal amount of iron. It has since been used on high grade zinc concentrates from which substantial recovery of secondary values can be realized. The lead, cadmium, and some of the silver, are collected in the zinc metal, while copper, gold, and the remaining silver are concentrated in the iron.

History of Method

Attempts to smelt zinc concentrates in electric furnaces are not new. Many patents have been granted describing such processes. One electrothermic method developed by the St. Joseph Lead Co. has been commercially successful. In that process, the charge is the resistor, and the residue is discharged dry.

Efforts to operate with an arc type furnace in which the residue is tapped off as molten slag have heretofore failed to achieve commercial success, due to a number of difficulties. These obstacles have been overcome in the Sterling Process.

An arc furnace may be operated with the electrodes submerged in the bath, in which case the heat is generated by the resistance of the slag. Alternatively, it may be operated with open arcs between the electrodes and the slag, in which case the heat is generated partly in the arcs and partly in the path of the current through the slag. There is a third method in which the unmelted charge covers the slag bath and the electrodes dip into the charge. The path of the current and the generation of heat is therefore partly in the multiple arcs from the electrodes to the particles of charge and from one particle to another, and partly through the slag.

In the Sterling Process, it was decided to operate with open arcs, so adjusting the voltage that the major part of the heat for reduction is generated in the arcs and radiated to the charge banks around the periphery of the furnace, only a minor part being generated in the slag. Most of the zinc reduction occurs in the charge banks. Since only a minor part of the heat for reduction need be transmitted through the slag, excessive slag temperatures with consequent refractory troubles are avoided.

Remove Molten Slag

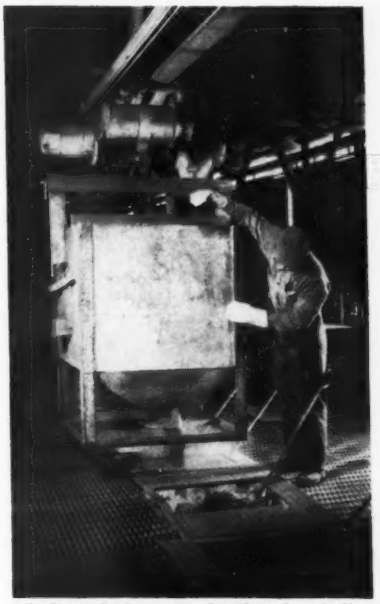
When a mixture of ZnO and C is heated, ZnO is reduced, forming Zn vapor and CO_2. Carbon monoxide, the active reducing agent, is regenerated from CO_2 by reaction with C. These reactions are reversible. Any CO_2 remaining in the reaction mixture will reoxidize Zn vapor during cooling. Fortunately, CO does not revert to CO_2 and C at a signicant rate except in the presence of catalysts. The reduction reaction takes place at a practical rate in the neighborhood of 1050° C. This is above the boiling point of zinc and it is therefore evolved as a vapor.

In the presence of C, the CO_2 content decreases with increasing temperature. It is therefore desirable to have the reaction mixture leave the reacting materials at as high a temperature as possible. In the ordinary zinc reduction processes, temperatures of 1050° C or somewhat above are usual and, since this is below the slagging temperature of the residue, a dry residue is left. An essential difference in the Sterling Process is that the temperatures involved are above the melting point of the residue and the residue is removed from the process as a molten slag.

This introduces a new factor. In the conventional retort reduction processes for zinc, an excess of reduction fuel is deliberately used and the excess removed with the residue. In the Sterling Process, any excess would accumulate on the surface of the bath with disturbing effects to the furnace operation. The carbon content of the charge must therefore be that which will be consumed in reducing the zinc and other metals present. Some iron is left in the slag, and the permissible latitude in the proportion of the iron reduced to metal serves as a buffer to compensate for some fluctuation in carbon content. Too high an iron content in the slag is undesirable, as it would be accompanied by very low carbon in the molten iron. This in turn would require high iron (and slag) temperatures to maintain the necessary fluidity for tapping.

Control Slag Composition

Another important factor in the success of the Sterling Process is the control of slag composition to achieve the required fluidity for tapping in a suitable temperature range. The slag must be held at a high enough temperature to keep the iron molten, but at this temperature must not have the excessive fluidity (beyond that required for tapping) which would result in attack on the refractories.



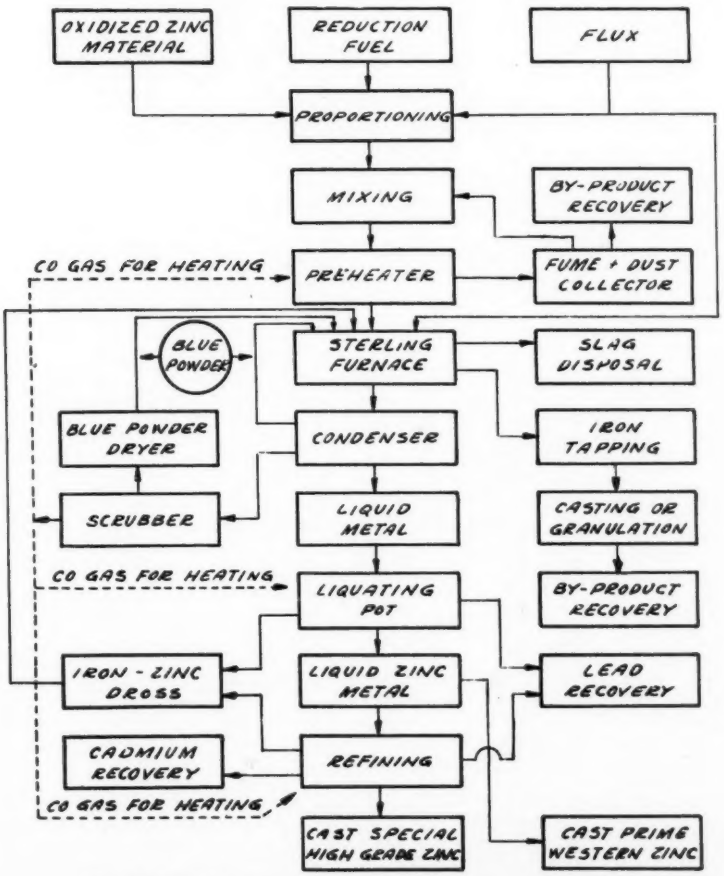
Preheated charge is distributed to individual hoppers

The major factors in controlling the furnace operation so as to deal successfully with the residue as slag and with the iron by-product, have been outlined. The principal remaining problem is to condense efficiently the zinc vapor in the gaseous products of reaction. In reminding the reader briefly of the reactions involved, we have pointed out the importance of controlling the composition of the gas leaving the furnace, particularly CO_2 content. The means of accomplishing this are complex, residing in considerable measure in the proper adjustment of interrelated factors in furnace operation. One important factor will be mentioned; namely, preheating of the charge.

Charge Preheated

There are several reasons for preheating the charge to the Sterling furnace. There is the simple matter of heat economy. The waste gas from the condensers has a heating value sufficient to preheat the charge to the maximum desired temperature and a corresponding saving in electric power is realized.

Furthermore, in preheating, some of the higher oxides of iron are partially reduced, thereby decreasing the amount of diluting gas generated in the furnace. Also, as pointed out earlier, the CO_2 content of the gases



Chemical requirements of ore, fuel and flux are not too stringent

leaving the furnace will decrease as the temperature at which they are last in contact with carbon increases. Since the gases exiting from the furnace pass over the fresh charge, it is desirable that this be as hot as possible.

The final problem, and one which has been a major stumbling block to previous attempts to develop arc smelting processes for zinc, is the condensation of the vapor. The difficulties of condensation which tend to arise in the arc smelting of zinc lie in the fact that the gas is dilute and that it tends to contain high CO_2 and considerable concentrations of dust particles which act as nuclei for blue powder formation. In the Sterling Process, by the several means outlined in the foregoing discussion, these tendencies have been brought under control to a point where a condensable gas is produced. Use of the splash condenser patented by The New Jersey Zinc Co., and previously described in the literature, has given high condensation efficiency.

Furnace Described

Having outlined the principles underlying the Sterling Process, we will describe the furnace itself and its operation.

A full sized furnace was put into operation at Palmerton in July 1951. It is a rectangular furnace having internal dimensions of 16 by 32 ft. The furnace is constructed of high grade firebrick with 24-in.-thick sidewalls, a three-course, inverted-arch bottom, and a 15-in.-thick, arched roof. At the crown of the arch, the inside height of the furnace is 10 ft. The bottom of the furnace is cooled by air, and the sidewalls are water-cooled. The furnace was originally heated with three 24-in.-diam (later replaced with 18-in.-diam) graphite electrodes in line along the arch. These are operated on three-phase circuit. The furnace is provided with 6000-kw transformer capacity, although maximum sustained input to the transformer up to the present time has been 5000 kw. At this rate of power input, the only limitation which has been encountered is the capacity of the condensers now installed on the furnace.

Can Use Coarse or Fine Ore

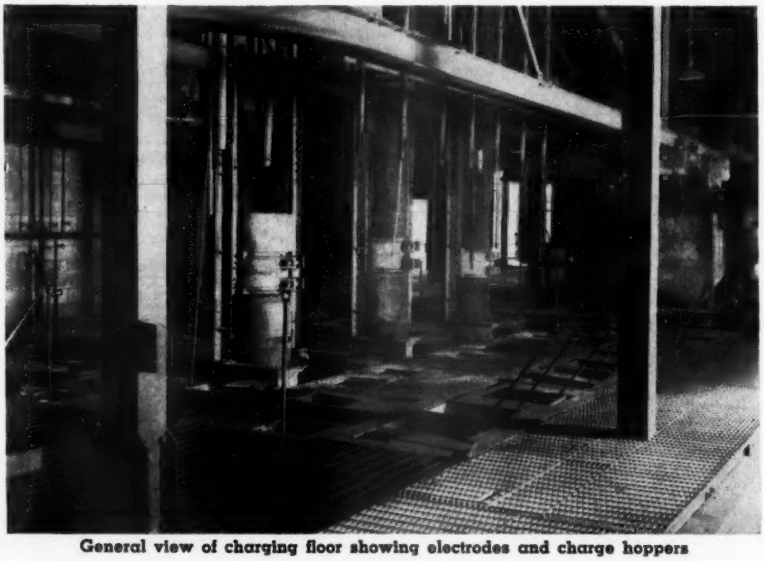
As indicated in the flowsheet, the oxidized zinc-bearing materials, reducing fuel, and flux are carefully proportioned and thoroughly blended. The zinc materials, coal, and flux do not have to be dry for use in the process—as long as their moisture content is known and can be adjusted for in the proportioning operation. Coarse ores having a screen size of 95 percent minus-½-in.-square opening and 95 percent on-200 mesh, as well as fine ores of 95 percent minus-eight mesh and 30 percent minus-200 mesh, have been smelted sucessfully. Reducing coal or coke and flux of the same general size ranges have been used without difficulty. As to sizing of raw materials in general, it is important that the mixture does not seriously segregate on preheating and charging, that the dust be held to a minmum, that there be reasonably good contact between ore, coal, and flux particles, and that the angle of repose of the charge banks in the furnaces not be too small.

The chemical requirements of the ore, coal, and flux are likewise not too stringent. The ore must be in the oxidized state with preferably not more than one percent total sulfur and/or one percent CO_2 present. Ores containing a considerable range of lead, cadmium, and copper have been treated up to the present time. Ores having as high as 20:1 zinc:iron ratio, and as low as 1:1, have been treated successfully. Reduction fuels with two to six percent volatile matter and 20 percent ash have been used. Fixed carbon preferably should be in the range of 60 to 80 percent.

Collect Dust and Fumes

The ore-fuel-flux mixture as described above is fed into a rotary preheater fired with the CO gas produced as by-product of the reduction operation. The time required for the mixture to travel through the preheater is about 2 hours. In this time, the mixture is heated from room temperature to 850-900°C., some of the coal volatile is removed, some of the Fe_2O_3 is reduced to FeO, and CuO —if present—is reduced to Cu_2O or Cu. In the preheating, some ore and coal dusts are produced together with some zinc, lead, and cadmium fume. These dusts and fumes are collected

Excellent operation has been established at average power input of 4500 kw



General view of charging floor showing electrodes and charge hoppers

in a mechanical bag filter and are recycled unless the percentage of such valuable metallic constituents as cadmium makes it advisable to recover them from this collected material.

The heated mixture as it discharges from the preheater is collected in insulated holding hoppers and from there it is withdrawn in 2-ton to 3-ton lots at desired intervals to charge to the Sterling furnace. The hot charge is conveyed to the furnace by monorail in an insulated car from which the charge is fed directly into a series of charge hoppers located in the roof of the furnace along the inside perimeter of the four walls. The recirculation and charging of by-product blue powder and dross are carried out in the same manner. The furnace receives a round of charge at one-hour intervals. The height of the charge banks and the width of the molten bath are checked at regular intervals by rod measurements through probe holes. The distribution of the charge is governed by the results of these probe measurements and the amount of charge is dictated by power input.

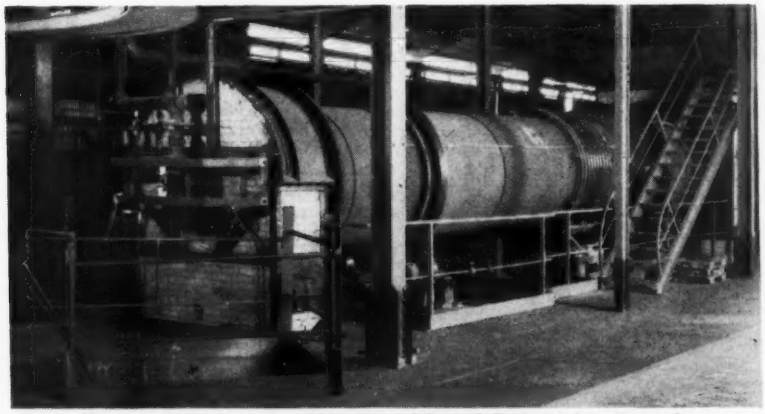
Ore Dictates Tap-Interval

The molten slag and iron collect in a pool on the hearth of the furnace surrounded by the charge banks. Sufficient iron is carried in the furnace to maintain a protective layer and permit 5-ton to 10-ton taps; and sufficient slag is maintained over the molten iron bath to avoid any direct contact of the arcs with molten iron. The iron and slag tapping intervals depend on the composition of ore worked. The iron is sand-cast and the slag is granulated for further disposition.

The volatile products of the reduction reaction (zinc vapor and CO gas, together with the lead, cadmium, and part of the silver) pass out of the furnace through refractory connectors into condensers of the splash type previously mentioned. The liquid metal collects in the condenser sumps where it is maintained at 500°C. by means of thermostatically operated water coils. The bath of molten metal is kept at a relatively constant level in the condenser sumps by continuous overflow or by periodic tapping into a ladle.

The non-condensable gas (largely CO) passes from each condenser into a scrubber where it is washed with fine water sprays to remove any solid materials. The dried blue powder from the gas scrubber system, together with any blue powder that collects in the condenser, is returned to the furnace.

The molten metal is transferred to a blending and liqudating pot where the lead and iron may be reduced to a point where the zinc metal will meet the requirements of Prime Western specification, provided other impurities in the ore are sufficiently low. The iron dross from the liquating pot after granulation or casting is recirculated to the Sterling furnace. The pig lead produced is sent to a lead refinery. Any cadmium in the charge will be contained in the slab zinc metal. Should the market demand a premium grade of zinc, or should the cadmium or other values call for further processing, the molten liquated metal can be refined to produce Special High Grade zinc. In the refining process, by-product metal values can be recovered and subjected to further refinement.



Furnace charge is preheated in rotary kiln and discharged continuously to hopper below

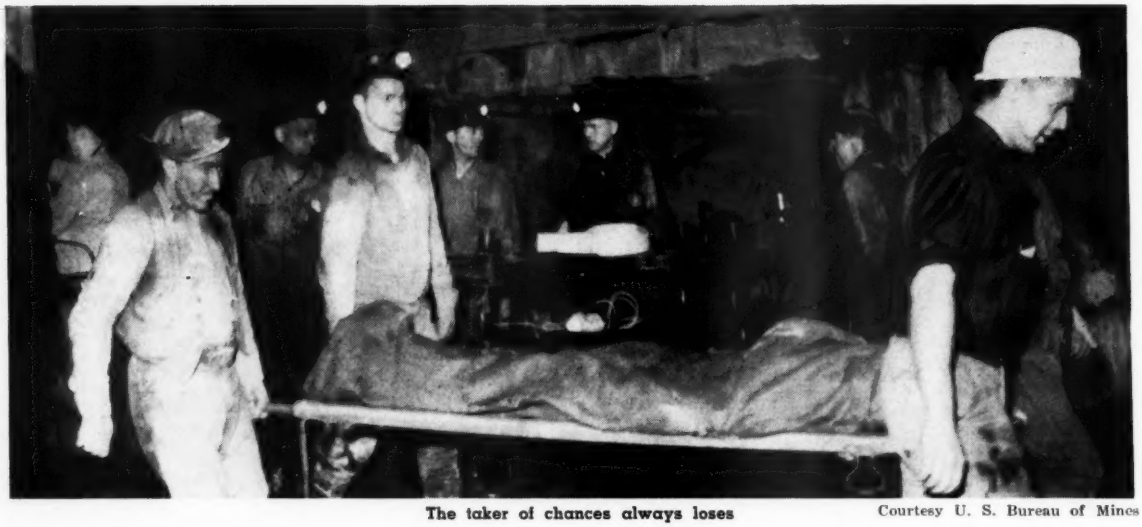
Molten zinc is tapped from condenser reservoir

Operating Experience

The first campaign on the large furnace lasted approximately nine months. By that time, certain minor changes in furnace design were indicated, primarily a change in electrode size. When the furnace was shut down to make the necessary changes, it was decided to rebuild the side walls and arch, which had suffered some damage in the first few weeks of operation, due to inexperience in handling the furnace.

The second campaign has been under way for two months. The changes proved well advised, and excellent operation has been established at an average power input of about 4500 kw. With a sinter running 58 percent zinc, 13 percent iron, the furnace power consumption per ton of liquated slab zinc cast, with all blue powder skimmings and dross recirculated, has run comfortably under the originally predicted 3000 kwh. Auxiliary power is 150 kwh per ton. The power factor is 95 percent or higher. It is anticipated that an operating time, including time down for

(Continued on page 78)



The taker of chances always loses

Courtesy U. S. Bureau of Mines

Benefits of a Safety Campaign to a Mine*

Apply the Golden Rule to Reap the Harvest of Increased Production, A Lower Accident Rate and Greater Peace of Mind

By A. G. GOSSARD
General Superintendent
Snow Hill Coal Corp.

"TO hell with safety" is an oft thought though seldom spoken statement that has crossed speedily—too, too speedily—through the minds of many an accident victim. Perhaps the statistician could give the odds against a single accident occurring as compared to the number of thoughts; but these figures are of little value. A person apt to have such thoughts has them all too frequently and his string soon runs out. He may really prove the old adage "Life is just a gamble" or, possibly from his ward bed, he may exclaim in a triumphant tone (but not meaning it) "We all have to go some time; it just wasn't my turn."

Factually speaking, his mind made the decision to take a chance, and it certainly was his particular life that was gambled. But what are the thoughts going on in the mind of his foreman, his supervisor, or his safety director. Were they, "This was just a bad break?" or "How can we prevent a similar accident in the future?" Or was it a geniune sense of responsibility shared and a feeling that something could have been done to prevent the accident? If it was the latter, then that man has the spark to commence a true safety program and his organization may be privileged to participate in the Benefits of a Safety Campaign.

From Personal Experience

Not too long ago, I was privileged to reap the harvests of a successful safety campaign. This experience started with appointment as general superintendent at a one-mine coal company in a district where I was not familiar with mining conditions or mining labor. The company had previously undergone a thorough reorganization and the new management, although not at all familiar with mining conditions, believed in good safety practices and was willing to provide the capital and pay the expenses necessary to promote safe conditions. The accident record of the company for the past quarter century had been bad, with three fires and explosions and an average of four fatalities (never less than one) per year.

Just before my arrival, the mine had had four fatalities and several serious accidents, with the severity rate running highest among supervisory personnel. In the first year of my supervision, the trend continued with five fatalities, three from roof falls and two from haulage. In each case, it was my sad duty to notify the distraught family, until it seemed that every time a miner's wife saw me coming up the road she shuddered from fear that I might stop at her house.

A nurse not knowing my company connection remarked to me upon accompanying a patient to the hospital that this mine was a "slaughterhouse" and should be shut down. Every time the phone rang at home a chill of fear went through me and my wife.

Program Started

During this period, certain safety practices were inaugurated. But the awful question "Is it doing any good?" kept ringing through our ears.

Strange as it may seem, after installing a system of close crossbeaming and cribbing in one portion of the mine several men actually quit, giving as their reason that the mine would shut down if it was necessary to do such timbering. Two of these men were fatally injured at the mines to which they went.

To aid in getting the program across, a safety director, considered

* Based on a paper delivered before the National Safety Congress.

to be capable of handling the over-all execution of the safety program was hired and given full authority. Soon after his arrival, a haulage fatality occurred. In spite of this, he was able to gain the confidence of the men and the safety program was under way.

This may seem like a long tale, but with four years of good accident records and no fatalities which followed, it is worth telling. My own mind is at ease. Wives of the workmen have lost the fear of seeing my car driving up their street, and the nurses at the hospital know that most of our hospital visits are to see sick employes and not injured ones. Another comforting fact is the possibility that many of the employes, after blasting me for something which they thought unjust to them, now may end their discussion with a statement to the effect, "The old buzzard does have one good point. He is a stickler for safety."

Output Up—Costs Down

There are some other interesting facts about this example worth discussing. First, the tonnage increased from 3900 tpd to 4600 tpd. The total cost of compensation fell from nine cents per ton to less than two cents, and the safety account actually was cut in half, with what seemed to be twice the amount of improvements charged to it.

Up to this point, the terms "safety program" and "safety campaign" have been used synonymously. Actually the Safety Campaign is the propaganda portion of the Safety Program. It is the spark plug which must be kept firing to keep the employes alert, informed, and enthused about the safety program. It consists of such things as poster, letters, awards to employes, planned programs, and the like introduced to break the monotony of what could be a dry safety program.

Where Do You Start?

Probably everyone in my position has faced the problem of how to get a safety campaign started. Often it seems ridiculously easy. However, about half the time, no logical "kick-off" presents itself. In such cases, the campaign is indefinitely delayed —and rightly so. A failure right at the beginning would set things back for a long time. Where this condition prevails the campaign should be started on a smaller basis at a higher level by first getting the official family in the "campaign" frame of mind. First, its members should be brought in as an actual part of the idea by having *planned* discussion type meetings. Once the workman's foreman is sold, it won't be long before he will begin selling some of his ideas to his men; and then you are started on a true safety campaign. Logically, to be prepared for a safety campaign each man must be willing to accept some sort of leadership. If he is not yet willing, it becomes a matter of education from the top down.

Safety Begins At Home

There is another important item—the necessity of giving everyone the opportunity to use his own ideas. A safety campaign which has its working origin and growth from within one single mine organization is the most likely to succeed. Certainly higher management should furnish the backing and do its part, but the actual work must be carried on at the mine level to breed the enthusiasm necessary to carry the campaign to success.

It won't be long before he is selling it to his men

Problem Child

After the ball is rolling and direct contact has been established with the employes, there are a certain few whom should be considered separately. These are the workmen most likely to be injured. One of these is the fatalist who believes that the explanation for a close shave is that it just wasn't his turn. Another is the daydreamer. The problem here is to keep his mind on his job.

Others are just naturally daredevils at heart. They should be driving racing cars. But, since they are employes, they must be made into safe workers. Last but not least, there is that group who just seem to be accident hazards because of their own awkwardness, sluggish thinking, and slow reactions. These four groups are the source of the majority of accidents.

Need Personal Touch

What are some of the benefits that can be derived from a safety campaign to help the members of these groups? First is the case of one fatalist, a machine operator who had received ten injuries in 15 years. He was finally talked into the idea of trying to work safely. Then by following up and pointing out to him the improvements in his own case—no accidents in the last six years—he finally became a believer. However, his foreman recently said that it still takes quite a lot of follow-up with a slam-bang showdown occasionally to keep him in line. Incidentally, this foreman has had only one accident on his section in the last six years. He is really working at his job.

Another familiar example is the daredevil. In one particular case, it happened to be a young man just out of high school who was hired for the third shift. With his newly acquired chew in one cheek and his pit cap set at a jaunty 45° angle, it was obvious that the foreman's complaints about this man were well grounded. The energy and daring the new man had used as star football player on the high school team was being used right there in the coal mine. Then to top it off, he began to be a "know-it-all" and an effective labor agitator. Fortunately, the boy was brilliant and a team man. Using this angle, the foreman went to work on him by pointing out that the hazards he was causing not only affected him but his buddies as well. This buddy angle worked, and it wasn't long until he was the ideal employe and taking correspondence courses to become a mechanic. He has since been promoted to mechanic, and in a few years should make a good supervisory employe.

Posters Pay

These are examples of men who required rather extensive, personal attention. There are others, not so hardheaded, whom a poster saying "Watch out for yourself and your buddy" would convince. Then there are some who wouldn't be affected by a poster, but who would get their spark from a monthly, ten minute safety meeting with their foremen—the type of meeting in which the crew discusses the importance of setting safety posts. It takes a lot of chips to cut through a log, but each one does its part.

Follow-Up Ideas

So far some of the problems of starting a safety campaign and getting the message to the employes who need it most have been discussed. This, of course, is the logical basis for a safety campaign, but it needs the follow-up of good accident reports showing what progress has been made, who is responsible for it, and where to go from there. A good display kept up to date monthly showing what section had the accidents, if any, what kind of accidents they were, and so on will hold the attention of the men. This also gives the management an opportunity to compliment and draw attention to those who are responsible for good performances. Also, in many cases it helps create enthusiasm to use this board to show the competitive standings of different safety teams.

At some mines each member of the teams that meet certain standards has been awarded a turkey for Christmas. A plan such as this affords a good chance to work out a safety campaign centered around this turkey theme. It gets to the entire family—wife, kids, grandma, and all. Giving credit where credit is due is a great aid in keeping interest up and the award can be worked out so that the savings in compensation more than pay the expense of the turkeys or whatever the award may be.

Cooperation Is Keynote

Production of coal and the well being of the company rest on both the company employes as supervisors and the union employes as the workmen. In most cases, this relationship has worked successfully but not without many problems. These occur at many levels and with a good safety program the inherent benefits can be realized at all of these levels.

In mechanical mining, the unit foreman is the fellow upon whom so much depends and of whom so much is expected. His is the job of continual contact with the workmen. A safety program that he has had a part in building gives him an opportunity to gain the confidence of his men and exercise an authority over which there will be a few disputes, as the safe way is the right way.

Too often it falls upon the lot of the unit boss to be principally a coal hustler. When this is true the safety inspector is the only man responsible for safety. This is a poor setup, and good production and safety are both doomed.

Where the safety committee meets with the mine foreman to discuss a particular safety program, the situation closely parallels the grievance procedure. Here it is better to have the committee enter negotiations with the feeling that the mine foreman they are to deal with is a safety minded *gentleman*, a man who will meet them on common ground to discuss mutual problems with an open mind.

How can each side of this meeting acquire these attitudes? Most likely through a good safety program. As a test of how well this attitude has been put across, observe the members of the safety committee when they accompany the state or federal mining inspector on his visits through the mine. Do they go along as informers or as a cooperative party eager to be helpful?

Don't Misuse Safety

Unfortunately, at the mine committee and superintendent level, safety is sometimes used as a means of applying pressure toward a favorable decision on another point. This is the first level of safety politics, and, in some cases, it shows up at higher levels. The publicity that results from such subversion often ends up as a black eye to the entire industry. Certainly, the majority of mines do not deserve this criticism because they have had workable safety programs which are getting results in effect for some time. Yet, these mines are dragged down into the "mud" when this type of "safety politics" is used as conclusive proof of the actions of all.

This is mentioned here, because such actions constitute a treacherous obstacle to the safety campaign of those mines conscientiously striving to do what is just.

Build on Training

The clinching argument for a thoroughgoing safety program and its accompanying safety campaign at every mine in the country is the growth of public sentiment demanding that something be done to accelerate the decline of the mine accident rate. This feeling crystallized in the laws recently passed to help toward this end. But these new laws admittedly decrease only the hazard from major disasters.

Cooperation of management, supervisors and miners is key to successful safety program

It is well known that the majority of our fatalities occur singly, one here and one there. To each of us is given the responsibility of drastically decreasing this total. But looking at this problem, even where management is doing everything possible to make its mine physically safe regardless of expense, it is easy to see many places where accidents could and would occur. So realizing how tough is the job of cutting down the probability of accidents where we know the possibilities will still exist, we can but come to the conclusion that the job of safety improvement is one of training; and the logical starting place is the "Safety Campaign" as an introduction for a good sound safety program.

"Do Unto Others—"

During the time this paper was in preparation, I had the good fortune to attend church one Sunday when a part of the minister's topic was an explanation of the Golden Rule. Actually his sermon was so similar to the subject of this article that probably it should have been borrowed and used here because the originating, planning, and execution of a safety campaign could ask no finer pattern than the Golden Rule—"Do Unto Others as You Would Have Them Do Unto You."

Where a little supervision helps a lot

For a number of years we've pointed out how Bethlehem prefabricated track can be a real tonic to your haulage system . . . how it's a big factor in getting the loads out faster and more economically.

But here's a point we haven't stressed: supervision. It's an important point—for even a *little* supervision will help you get the *most* out of your track.

If you installed a new machine worth ten or twenty thousand dollars, you'd be careful of it, wouldn't you? Careful to see that your men were instructed in its use? That same degree of care will also help protect your investment in prefabricated track.

Here are some things to bear in mind:

Bethlehem prefabricated track comes to you ready for installation, with every rail and every part tailored to fit. Use only the original, genuine parts when making the installation. Prior to assembly, don't let the components lie around where losses can occur. Don't let the parts be used for repairs to other track; if you do, there will be shortages when you go to assemble your Bethlehem system.

And *do* see that your men are guided by the blueprints that come with the system. They're easy to follow, for the rails themselves are numbered and are keyed to equivalent numbers on the blueprints. (Incidentally, this makes it simple to order replacement rails when you need them; merely order by number.)

It doesn't take *much* supervision . . . but a little will more than repay the time and effort expended.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Beth'ehem Pacific Coast Steel Corporation. *Export Distributor:* Beth'ehem Steel Export Corporation

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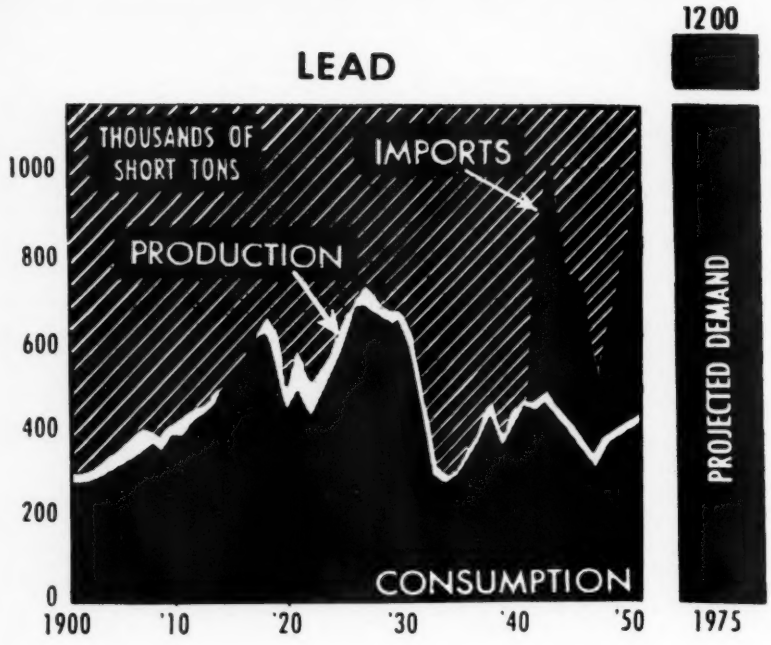
BETHLEHEM PREFABRICATED TRACK



Outlook In Lead

As Seen By An Industry Spokesman and By The President's Materials Policy Commission

By BRUCE CHARLTON NETSCHERT
Formerly Staff Member
President's Materials Policy Commission

THE report of the President's Materials Policy Commission has received both approval and criticism among the mining industry since its publication last June. As the report deals with controversial issues and involves judgments as to the future course of events, criticism is to be expected. Indeed, one of the most valuable results of the Commission's work has been that industry, in order to assess and evaluate the report, has made its own analyses of what may be expected to develop over the long term.

Inevitably some of the sharpest criticism has been directed at the Commission's projections to the year 1975 of demand for individual commodities. Obviously, these projections cannot be proved either right or wrong at present. Moreover, as repeatedly stated in the Commission's report, they have not been presented as predictions, but as bases for indicating the problems that may arise.

It is also obvious that the method of projection used by the Commission is not the only one possible. Criticism of the Commission's results based on an alternative method is therefore valuable in that it presents to the impartial observer the necessity of judging the merits of different methods and the signficance of the results obtained.

One such criticism has been so severe that it justifies rebuttal. In an address delivered to the American Mining Congress on September 22, 1952, (MINING CONGRESS JOURNAL, December, 1952, page 39) and which has received wide publicity, Mr. Andrew Fletcher of the St. Joseph Lead Co. presented an alternative set of projections and estimates for lead so different from the Commission's projections and estimates that, as he pointed out, the implications of the respective conclusions are highly contradictory.

Difference of Opinion

More is involved, however, than a difference of opinion as to methods of projection, for Mr. Fletcher contended that the Commission's projections contain errors of fact. Indeed, his address implied that these errors cast doubt on the value of the entire body of commodity studies included in the Commission's report.

The differences between the results of the study by the President's Materials Policy Commission and that of Mr. Fletcher are summarized in the table. The Fletcher projection for consumption is lower than the Commission's, the estimate for mine production and the projection of secondary production are higher. The result is a difference of 700,000 tons or more between the two estimates of net imports in 1975. This enormous difference leads, as Mr. Fletcher points out, to a sharp divergence of opinion as to the problems with respect to lead which this country may face in the next 25 years.

Consumption Data Examined

Mr. Fletcher believes it incorrect procedure to use 1950 as a base year for projection, because "1950 consumption was the highest in history." The implication seems to be that 1950 consumption was abnormally high. To some extent this was true, but adjustments to reflect this circumstance were made in the percentage growth factor applied to specific end uses. Mainly, however, the high level of 1950 consumption was due not

UNITED STATES LEAD POSITION 1950 AND PROJECTED 1975
(thousand short tons)

	1590	*Estimated 1975*	
		Commission	*Fletcher*
Consumption (actual)	1,212	1,950	1,420
Production:			
Mine	430	300	375
Secondary	428	750	850
Total production	858	1,050	1,225
Imports (net)	565	900	195

Total supply (total production plus net imports) for 1950 does not equal consumption in that year because the two totals were arrived at independently. The consumption figure is from the Lead Industries Association. The difference between it and total supply is accounted for chiefly by government stockpiling activities. The exact equivalence in the 1975 figures is due to the fact that the import figures represent the difference between consumption and total domestic production.

to abnormal circumstances but to general prosperity, to full employment. Inasmuch as the working assumption of the Commission was for full employment in 1975, the 1950 level of consumption is not out of line. The reason for assuming full employment in 1975 is fully discussed in the Commission's report; the question is not raised by Mr. Fletcher.

Mr. Fletcher makes what he terms "another pertinent criticism" with respect to the consumption projection in pointing to an "error" in a figure for consumption in 1943, the "error" being that the consumption figure contains, according to Mr. Fletcher, 300,000 tons stockpiled in that year. The relevance of this "criticism" is obscure, for there is no reference in the lead chapter to the year 1943 in the discussion of 1950 consumption. The figure of 1,330,000 tons appears in a table (PMPC Report, Vol. II, p. 39) as the consumption in 1942, and intentionally included additions to government stocks. The heading of the column in which it appears reads: "Apparent consumption (total production plus imports minus exports)." The purpose of using this definition of consumption was twofold—to get a series of comparable figures running back to the beginning of the century, in order to show the general growth in consumption over the past 50 years (actual consumption figures being unobtainable for earlier years), and to avoid revealing stockpile acquisitions. The table was for informative purposes only; none of the consumption statistics contained in it entered the projection calculations.

Alternative Projection

In presenting an alternative projection of consumption in 1975 Mr. Fletcher indulges in considerable generalization. He bases the projection, for example, on per capita consumption of lead, and states that this remains fairly steady "year after year." It is difficult to see how he reaches this conclusion, for per capita consumption has been not fairly steady, but on the contrary, highly volatile. During the 1920's the yearly per capita consumption ranged from a low of roughly 10 lbs to a high of some 15.5 lbs; in the 1930's it ranged between 7 and 12 lbs; and during the 1940's it ranged between the approximate extremes of 11.5 and 20 lbs.

As evidence of the supposed stability Mr. Fletcher offers the following: "The average per capita consumption for the two decades of the 1920's and 1940's—both periods of high industrial activity, is around 15 lbs." If this is an attempt to prove stability during two different, non-consecutive periods by citing the average for the two together, it is a misuse of statistics.

EDITOR'S NOTE:

Before printing Mr. Netschert's article, a copy was sent to Mr. Fletcher, who made the following comments:

"I have read the article by Mr. Bruce Carlton Netschert, who was a member of the Commission staff on commodity studies, but my underlying disagreement with the Commission's findings, especially in respect to lead, is unchanged.

"In connection with Mr. Netschert's observations, I offer the following:

"1. In referring to the war year consumption of 1,330,000 tons, there is a typographical error in my paper as 1943 should be 1942, which is the year used by the Commission in their Table II on Page 39, Volume II, and the one to which I had taken exception, as a justification for using 1950 as a representative year. Although Mr. Netschert states: 'The figure of 1,330,000 tons appears in a table (PMPC Report, Vol. II, p. 39) as the consumption in 1942, and intentionally included additions to government stocks'—it unfortunately does not so indicate, because in the same Table there is an asterisk for 1950 and a footnote showing that in this year the actual consumption was 1,212,000 tons. The inconsistency is misleading. As I stated, the 1942 actual consumption was approximately 1,000,000 tons, because about 300,000 tons were placed in stockpile. I do not consider that stockpiling can ever be correctly considered as consumption. Present lead and zinc prices, which have been greatly depressed due to foreign liquidation of stockpiles, support this viewpoint!

"2. I hope that Mr. Netschert and I will both live until 1975 and thereby have the opportunity of seeing whether my guess of 14.7 pounds per capita is better than his 19-20 pounds. I prefer the per capita basis, which gives consideration to price, employment and technical changes, rather than the end use method of estimating with an assumed continuing full employment. It is especially difficult for me to agree with the Commission's method when it forecasts, 'The demand for lead in the United States has been projected to increase over the next 25 years by some 60 percent of its present level . . .' (Page 39, Vol. II) with their finding (Page 40, Vol. II), 'The total consumption of lead grew by only 30 percent between the period 1924-27 and 1947-50, or about 28 percent as fast as the total national production of goods and services.'

"3. With respect to scrap, Mr. Netschert defends the Commission's figures by distinguishing between old and new lead scrap. To my mind, this distinction is meaningless. New scrap, according to the Bureau of Mines, is material which is consumed elsewhere, either after sale to another company or shipment to another plant of the same company, and is not 'run-around material repeating the cycle during the year,' as Mr. Netschert claims. The Bureau classes run-around scrap as Home scrap, and as such is not included in production. It is also signficant that the Bureau and various statistical agencies consider secondary production as including old and new scrap, and I follow this standard procedure. I believe, therefore, that the Commission, in its analysis of the 1950 picture, should have shown as secondary production (Table III, Page 42, Vol. II), 482,000 and not 428,000.

"I can see no reason for changing the following statement made in my September Denver talk:

" 'Whether we or the Commission are even reasonably close to a correct deficit estimate, would be only of academic interest to prove that different figures and assumptions give an entirely changed picture—if it were not for the fact that the Commission's forecast is subject to severe criticism. Furthermore, their 900,000-ton deficit may have frightened them into recommending the adoption of such alien control measures as multilateral government contracts, buffer stocks, quotas, etc., which if adopted, will result in the socialization of the domestic, as well as the world, mining industries.'

Andrew Fletcher."

TABLE II.
SUPPLY AND CONSUMPTION OF LEAD IN THE UNITED STATES, SELECTED YEARS, 1900-1950
[Thousand short tons]

Year	Mine Production	Production from Old Scrap	Net Imports	Apparent Consumption (Total Production Plus Imports Minus Exports)
1900	271	(†)	7	278
1910	383	49	21	453
1917	629	82	7	718
1920	497	110	90	697
1925	684	200	29	913
1930	558	225	28	811
1940	457	227	107	791
1942	496	309	525	1,330
1950	430	428	565	*1,423

* Actual consumption was 1,212 thousand.
† Not available.
Source: U. S. Bureau of Mines, except for actual consumption. PMPC Report, Vol. II, P. 39.

The equivalence of the two "periods of high industrial activity" is itself a matter for dispute, but the significant question is: How does the average per capita consumption of each of the two periods compare with the other? For the 1920's it was slightly more than 13 lbs, and for the 1940's somewhat less than 15.5 lbs, an increase of some 20 percent.

Proceeding, then, from this erroneous assumption of stability in per capita consumption, Mr. Fletcher takes the average for the past 10 years and applies it to the projected population in 1975, obtaining a figure of 1,420,000 tons. The assumption here is that per capita consumption for the next 25 years will average the same as for the past ten. This contrasts strangely with the rising trend over the past 50 years. If anything is to be projected it is this past growth trend. On this basis the projection of per capita consumption for 1975 is between 19 and 20 lbs, or a total consumption in 1975 of approximately 1.9 million tons.

It is, of course, a complete coincidence that the projection of per capita consumption yields substantially the same results as the projection method used in the Commission's report. The figure is presented here not in support of the Commission's projection, but solely for the purpose of demonstrating the correct use of per capita consumption as a projection base. Mr. Fletcher's "projection" is disputed not because it differs from the Commission's projection but because it is erroneous in its own context.

Trends Compared

Mr. Fletcher then tries another approach. He compares the percentage growth in annual lead consumption over the past 25 years with the percentage growth in population over the same period; and, finding them roughly equal, he then assumes that this equivalence will continue. According to this method, lead consumption is so largely determined by the population size that the level of business activity, technological changes, increases in the standard of living, and other similar factors can be disregarded.

This approach fails to recognize that the equal percentage growth in population and lead consumption during the past 25 years is only a statistical coincidence. The several significant changes in the end-use pattern of lead that have occurred in that time (See PMPC Report, Vol. II, p. 41) will not necessarily continue during the coming 25 years, nor will they necessarily take place to the same extent. Indeed, the Commission's report makes clear that further changes in the end-use pattern will take place, but will probably be quite different from those that have already occurred. The method of projection used in the report takes this directly into account by assigning a growth factor to each of the different end uses based on the expected growth in certain economic aggregates that are the determinants of the end uses. (See PMPC Report, Vol. II, Chapter 22.)

In any event, it would appear that Mr. Fletcher was setting up a straw man, for after noting that his second projection yields a 1975 consumption figure of 1,250,000 tons, he immediately rejects it in favor of his previous projection of 1,420,000 tons on the grounds that "we in the lead industry are constantly striving to increase our markets." In this light the latter figure is made to appear the result of tempered appraisal.

Production Picture

Mr. Fletcher presents his own estimate of 375,000 tons as the mine production in 1975 against the Commission estimate of 300,000 tons at most. This, of course, is entirely a matter of judgment, and admittedly the judgment of a leading member of the industry should be given considered weight.

Without attempting to defend the Commission's estimate (the basis of which is presented in the Commission's report) it should be pointed out that the figure of 300,000 tons, and the reasons behind it, represent the consensus of a considerable body of technical opinion, including that of independent geologists, mining engineers, and members of the lead-mining industry. Mr. Fletcher implies that the Commission estimate is unduly low, but there are also those who are equally convinced that the estimate is unduly high. (See, for example, S. G. Lasky, "Mineral Industry Futures Can Be Predicted," *Engineering and Mining Journal*, August, 1951.)

Nevertheless, Mr. Fletcher's estimate is accepted for the purpose of this discussion, as the major point at issue is not the level of mine production but the magnitude of needed U. S. net imports in 1975, and the significance thereof. The difference between the Commission and Fletcher estimates of mine production is important only as it affects the level of imports.

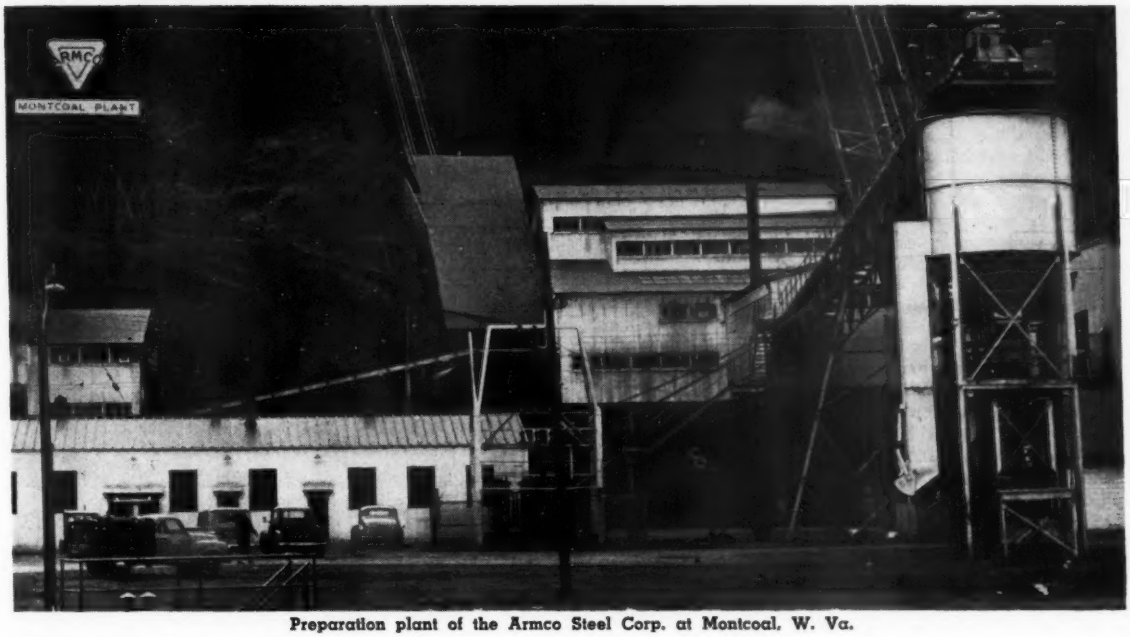
Scrap Defined

With respect to scrap production, Mr. Fletcher cites another alleged "error" in the Commission's report. According to him, the correct figure for scrap recovery of lead in 1950 is 482,000 tons—not 428,000 tons as used by the Commission. This is merely a matter of statistical definition. Total lead scrap recovery in 1950 was 482,275 tons; the recovery from new scrap was 54,755 tons; and from old scrap the recovery was 427,520 tons.

Perhaps, though, Mr. Fletcher considers that the error lies in the choice of old scrap only rather than of total scrap, for use of the figure for old scrap alone rather than total scrap is contrary to industry usage. The answer is that the purpose in the lead commodity study was to measure total expected supply against total expected demand. New scrap, which is obtained from current production and fabrication and is therefore run-around material repeating the cycle during the year, represents no net addition to total current supply. The correct scrap figure *in this context*, therefore, is for old scrap only, and neither the base figure nor the projection contains any new scrap tonnage.

Having disposed of the "error" in the Commission's scrap figure for 1950, Mr. Fletcher constructs his own projection for 1975 and arrives at a

(Continued on page 80)



Preparation plant of the Armco Steel Corp. at Montcoal, W. Va.

Close Fine Coal Cleaning Circuit at Montcoal

Armco Maintains Wash Water at 10.8 Percent Solids in Closed Circuit

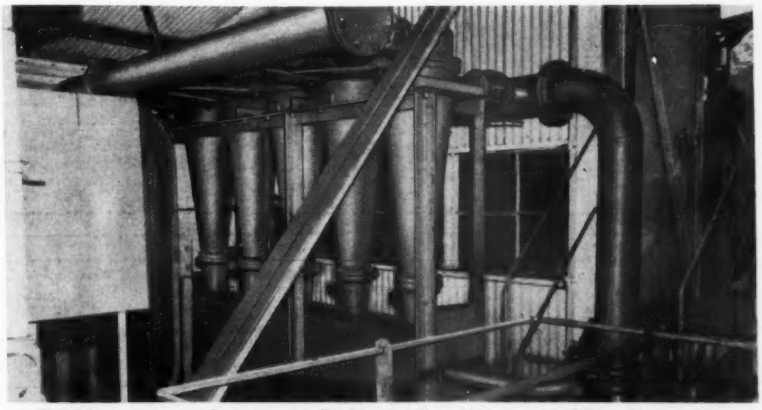
By H. A. FEAZELLE and PAUL R. MAXEY
Preparation Engineer Mining Engineer
Mining Division, Armco Steel Corp.

COAL from three seams, the Dorothy, the No. 5 Block, and the Hernshaw, is processed at the Montcoal, W. Va., plant of the Armco Steel Corp. Coal from each seam is washed separately. The original plant, furnished and erected by the Jeffrey Manufacturing Co., was put in operation in July, 1948, and employed primarily a jig circuit. Originally designed for 250 tph of raw coal, it has handled 300 tph successfully for sustained periods. The raw coal entering the plant goes over sizing shakers where the plus 5-in. lump is separated and sent over picking tables and thence to the lump loading booms.

The minus 5-in. run-of-mine is conveyed to an 84-in., two-compartment Baum type jig. Sink material from the first compartment goes directly to refuse. All the sink material from the second compartment is re-circulated through the jig for additional recovery after being crushed to minus ¼-in. Refuse leaves the plant by belt to an aerial tram system which carries it several hundred feet over a mountain. Since full seam mining is practiced at Montcoal, this tramway disposes of approximately 50 tph of refuse.

The Minus ¼-in. Goes to Bird

Washed coal from the jig is flumed to Parrish type de-watering and sizing shakers which drop the minus ¼-in. fraction into an 80,000-gal capacity settling tank. The ¼-in. by 5-in. fraction is carried from the sizing shakers to the railroad cars by a four-compartment drag conveyor so arranged that almost any size combination can be loaded. The minus



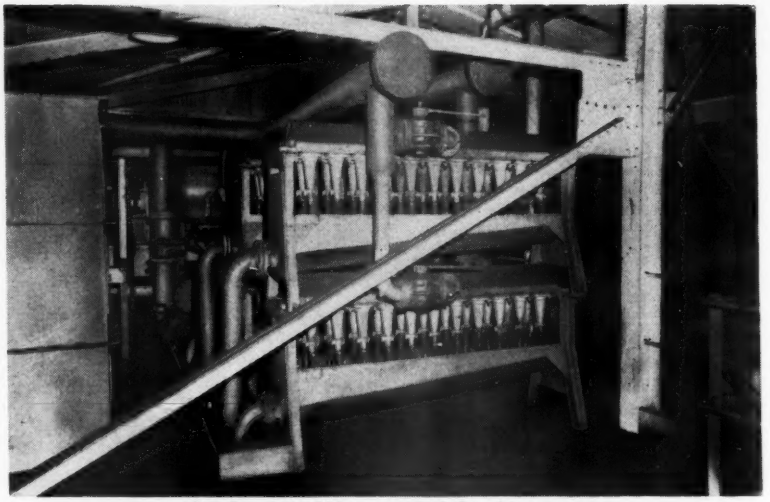
The 14-in. cones produce an overflow containing 10 percent solids and an underflow with 48 percent solids

¼-in., under product of the sizing screens, is dragged to the end of the settling tank and dropped into a collecting sump. From this sump it is pumped to a 54-in. by 70-in. Bird filter for de-watering.

The Bird filter cake is conveyed to the railroad cars where it is usually loaded as a component of the 2-in. by 0 or 3-in. by 0 slack. The Bird effluent is returned to the settling tank.

Several undesirable features developed while operating with this flow scheme. The centrifuge cake was too high in moisture content because of a buildup of fines in the system. The solids concentration of the circulating water built up rapidly and the settling tank had to be drained each week to hold the concentration to a limit in keeping with good washing efficiency. Furthermore, it was necessary to continually discharge about 60 gpm of wash water containing approximately 12 percent solids to a nearby stream. This plant bleed included a sizable portion of fine but marketable coal.

Since it has been the policy of the Armco Steel Corp. to cooperate with all anti-pollution agencies and since there was a chance by the recovery of fine coal and the preparation of a more satisfactory product to make the project self-sustaining, ways were sought to remedy these deficiencies. In November, 1950, a contract was awarded to Heyl & Patterson, Inc., for a series installation of 14-in. diam and 3-in. diam cyclone thickeners in conjunction with a disc type vacuum filter to eliminate these difficulties. The flow scheme of this clarification and recovery circuit as worked into the original plant is shown in Figure I.



Overflow from 14-in. cones is fed to 3-in. cones

1500 GPM to Cones

At the discharge end of the settling tank and about two ft below the water level, approximately 1500 gpm of water is drawn from the circulating system and is pumped to a battery of five 14-in. diam cyclone thickeners.

These cyclones operating at 45 psi pressure, produce an underflow of 48 percent solids concentration which is sluiced to one compartment of a ten disc 8 ft 10 in. diam Eimco vacuum filter.

Overflow from the 14-in. cyclones at about 10 percent solids runs into a 1250 gal capacity sump on the cyclone floor. From here it is pumped to five banks of 3-in. diam cyclone thickeners at 40 psi pressure. Each bank of the 3-in. cyclones contains 22 cones.

Underflow from the 3-in. cyclones is sluiced to the other compartment of the Eimco filter. Upon leaving the

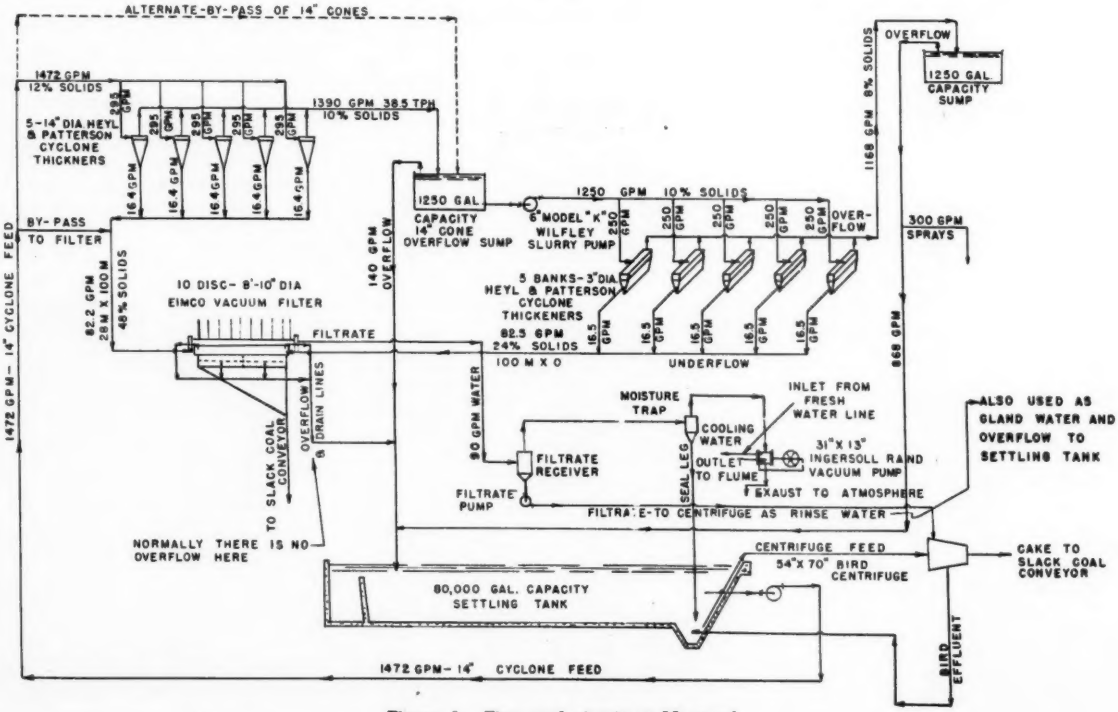

ALTERNATE-BY-PASS OF 14" CONES
1472 GPM 12% SOLIDS
5-14" DIA HEYL & PATTERSON CYCLONE THICKNERS
1390 GPM 38.5 TPH 10% SOLIDS
BY-PASS TO FILTER
1472 GPM-14" CYCLONE FEED
10 DISC-8'-10" DIA EIMCO VACUUM FILTER
82.2 GPM 28 M X 100 M 48% SOLIDS
FILTRATE
140 GPM OVERFLOW
1250 GAL CAPACITY 14" CONE OVERFLOW SUMP
1250 GPM 10% SOLIDS
6" MODEL "K" WILFLEY SLURRY PUMP
5 BANKS-3" DIA HEYL & PATTERSON CYCLONE THICKENERS
82.5 GPM 24% SOLIDS
100 M X 0
UNDERFLOW
OVERFLOW
1250 GAL CAPACITY SUMP
1168 GPM 8% SOLIDS
300 GPM SPRAYS
868 GPM
ALSO USED AS GLAND WATER AND OVERFLOW TO SETTLING TANK
NOISTURE TRAP
INLET FROM FRESH WATER LINE
COOLING WATER
OUTLET TO FLUME
31"X 13" INGERSOLL RAND VACUUM PUMP
EXAUST TO ATMOSPHERE
SEAL LEG
90 GPM WATER
FILTRATE RECEIVER
FILTRATE PUMP
FILTRATE TO CENTRIFUGE AS RINSE WATER
TO SLACK COAL CONVEYOR
OVERFLOW & DRAIN LINES
NORMALLY THERE IS NO OVERFLOW HERE
CENTRIFUGE FEED
54"X 70" BIRD CENTRIFUGE
CAKE TO SLACK COAL CONVEYOR
80,000 GAL. CAPACITY SETTLING TANK
BIRD EFFLUENT
1472 GPM-14" CYCLONE FEED

Figure 1. Fine coal circuit at Montcoal

TABLE I
SCREEN ANALYSIS

Size Passing	Retained On	Percent Weight
	28 M	0.8
28 M	60 M	7.5
60 M	100 M	6.1
100 M	200 M	7.1
200 M	325 M	3.8
325 M	0	74.7
Total		100.0

Feed to 14-in. Cyclones.
Percent dry solids=12.6

TABLE II
SCREEN ANALYSIS

Size Passing	Retained On	Percent Weight
	28 M	2.5
28 M	60 M	23.5
60 M	100 M	21.0
100 M	200 M	26.2
200 M	325 M	8.6
325 M	0	18.2
Total		100.0

Underflow from 14-in. Cyclones. (Equals part of feed to vacuum filter)
Percent Dry Solids=48.5

TABLE III
SCREEN ANALYSIS

Size Passing	Retained On	Percent Weight
	100 M	0.1
100 M	200 M	0.6
200 M	325 M	1.9
325 M	0	97.4
Total		100.0

Overflow from 14-in. Cyclones. (Equals Feed to 3-in. Cyclones)
Percent Dry Solids=10.1

TABLE IV
SCREEN ANALYSIS

Size Passing	Retained On	Percent Weight
	100 M	
100 M	200 M	3.2
200 M	325 M	15.1
325 M	0	81.7
Total		100.0

Underflow from 3-in. Cyclones. (Equals Remainder of Feed to Vacuum Filter)
Percent Dry Solids=23.8

TABLE V
SCREEN ANALYSIS

Size Passing	Retained On	Percent Weight
	100 M	....
100 M	200 M	....
200 M	325 M	0.2
325 M	0	99.8
Total		100.0

Overflow from 3-in. Cyclones.
Percent Dry Solids=8.2

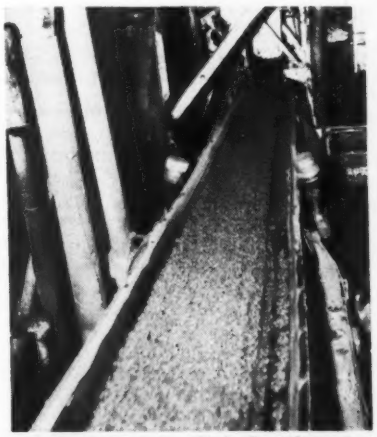
filter the cakes from the two compartments are blended and become a component of the 2 in. by 0 or 3 in. by 0 slack.

Overflow from the 3-in. cyclones at about 8 percent solids, enters a second 1250-gal sump. Water from this sump is used for dilution of filter feed as needed and for sprays mounted over the clean coal sizing shakers. The overflow from this sump is returned to the circulating water circuit. Tables I through V give the size consist and solids concentration in these feeds and products.

Recover 22 TPH Fines

About 22 wet tph of minus-28 mesh solids are removed by this circuit, 15 tph by the 14-in. diam cyclones and seven tph by the 3-in. diam cyclones. Size consists of the vacuum filter feed are shown in Tables II and IV. The filter cake from the 14-in. cyclones averages about 25 percent moisture; that from the 3-in. cyclone averages about 28 percent moisture. About 25 in. of vacuum is normally employed.

In an effort to obtain the best filter media several different fabrics were tried. Nylon (Eimco No. 301 Twill Weave) has proven to be the best cloth for wear, non-blinding and filtrate clarity and has been adapted for the entire filter. A bag life of 8 to 12 months is being experienced with this media. However, experiments are under way or are to be made with Hi-Twist MultaFilament



Product from the Bird Centrifuge is loaded out with slack coal

Eimco Nylon No. 355 and with wire mesh.

Filtrate from the vacuum filter is piped to the Bird Centrifuge for use as rinse water and is used on some of the pumps in the plants that require gland water. Its clarity is shown by the analysis in Table VI.

An Ingersoll-Rand Type E.S.-1 Vacuum Pump, driven by a 100-hp motor is used with the vacuum filter. Wilfley Model "K" Centrifugal Slurry Pumps are used to feed the Cyclone

Thickeners. These pumps, which do not require gland sealing water, are driven by 150 hp and 75 hp, totally enclosed, fan cooled motors.

Maintenance Low

Maintenance of the cyclone thickeners has been very light. The only replacements have been Ni-Hard Inserts for the underflow orifices of the 14-in. cyclones and the soft rubber inserts for the underflow orifices of the 3-in. cyclones. This has been over a period of 15 months with double shift operation. The feed sump for the 3-in. cyclones is covered with a ⅛-in. round hole stainless steel plate so that no difficulty has been experienced with oversize material.

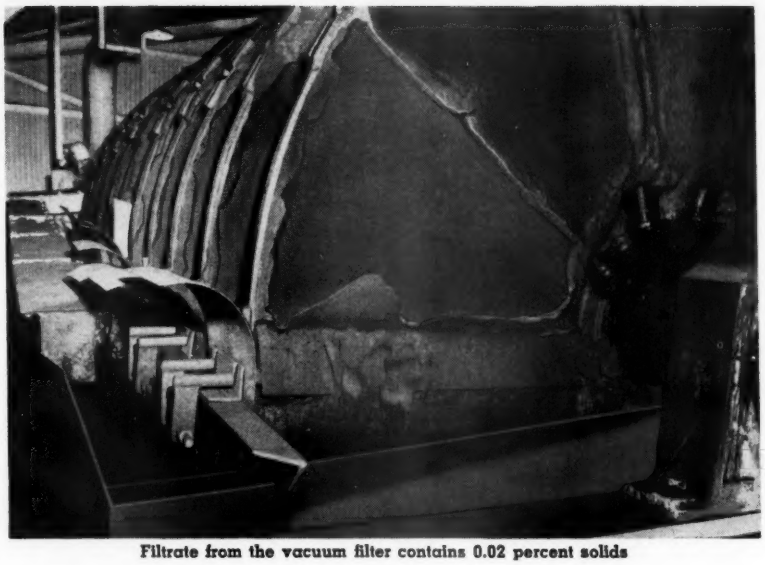
Performance of the Bird Centrifuge has been greatly improved by the removal of fines from the system and by the development of a new type rinseable screw by the Bird Machine Co. Moistures of from 9 to 10 percent in the Bird Cake are easily obtainable when the screw or conveyor blades are in good condition. However, these conveyors require removal and hard facing of their blades at least every four months (two shift operation) if moisture is to be held near 10 percent. Table VII is an analysis of the Bird Centrifuge product which amounts to approximately 50 wet tons per hour at 10 percent moisture. An analysis of the Bird effluent, which goes back to the settling tank, is also given in Table VIII.

A sample of the circulating water taken near the push water intake to the jig gave the analysis shown in Table IX.

TABLE VI
SCREEN ANALYSIS

Size Passing	Retained On	Percent Weight
	100 M	....
100 M	200 M	....
200 M	325 M	34.0
325 M	0	66.0
Total		100.0

Filtrate from Eimco Vacuum Filter—Filtrate
Percent Dry Solids=0.02
235 Parts Per Million



Filtrate from the vacuum filter contains 0.02 percent solids

TABLE VII
SCREEN ANALYSIS

Size Passing	Retained On	Percent Weight
	¼" Rd.	0.2
¼" Rd.	⅛" Rd.	9.1
⅛" Rd.	28 Mesh	49.9
28 Mesh	48 Mesh	20.7
48 Mesh	100 Mesh	5.8
100 Mesh	200 Mesh	4.1
200 Mesh	325 Mesh	1.7
325 Mesh	0	8.5
Total		100.0

Bird Centrifuge Cake Total Moisture=9.30
(This moisture is that obtained from a newly rebuilt conveyor.)

TABLE VIII
SCREEN ANALYSIS

Size Passing	Retained On	Percent Weight
	100 M	17.9
100 M	200 M	4.4
200 M	325 M	2.7
325 M	0	75.0
Total		100.0

Effluent from Bird Centrifuge
Percent Dry Solids=12.4

TABLE IX
SCREEN ANALYSIS

Size Passing	Retained On	(Dry Basis) Percent Weight
	100 Mesh	4.2
100 Mesh	200 Mesh	3.5
200 Mesh	325 Mesh	2.3
325 Mesh	0 Mesh	90.0
Total		100.0

Circulating Water
Percent Dry Solids=10.8

Objective Obtained

In conclusion it can be fairly stated that the objectives of this plant and the fine coal circuit have been attained. Under normal conditions the plant can be operated in closed circuit without plant bleed. No purging is necessary, all fine coal is being recovered and an acceptable moisture and ash product is being delivered. The 2-in. by 0 slack, which contains both the Bird Centrifuge and Eimco filter cakes, averages 6.3 percent ash and 5.5 percent total moisture.

Operators Corner

Simplify Analytic Procedure

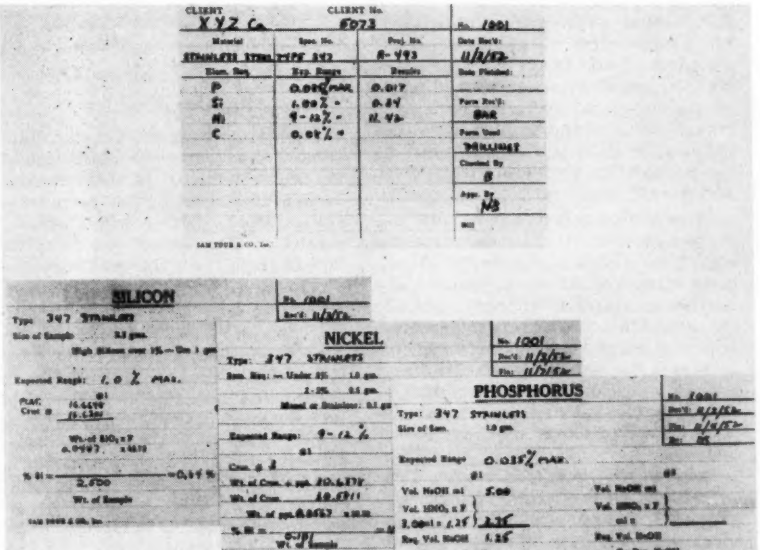
Card System Helps Keep Track of Samples and Saves Time for Assayer and His Supervisors

A TIMESAVING system of records control for following the progress of routine analytical work on large numbers of samples has been developed by the analytical section of the chemical engineering department of Sam Tour & Co., Inc., a New York City firm of consulting and research engineers.

This system offers two important advantages in simplifying the operation of an analytical laboratory. First, it enables supervisory personnel to know at a glance the progress of work involving a series of analytical steps. Second, it saves the person who actually does the work a considerable amount of non-productive clerical time by giving him a simplified, standardized form, complete with pre-calculated constants, on which to record and calculate his results.

The records system is based on a set of 4 by 6-in. cards. Each set has a master card which contains information about the origin of the sample, the series of analyses required, and finally, the results of each analysis as they are reported. Each of the remaining cards in the set corresponds to an individual analysis and these cards are distributed to those who perform the analysis. These analysis-data cards identify the sample and give the expected range of results. For certain analyses, the weight of sample needed to insure accuracy within the expected range is already stamped on the card.

Analysis-data cards are printed so that all data needed for subsequent calculations, (such as the weight of sample, weight of precipitate, or volume and normality of titrant, etc.) are written in a space where they are used directly in the calculations. Thus, time is saved and the possibility of error is greatly reduced because an absolute minimum of recorded data is necessary.



A partial set of analytical data record cards giving results for three of the four analyses specified on the master card. For illustrative purposes, the second set of results for each analysis has been omitted

Another timesaving feature is that, whenever possible, all numerical factors required to convert analytical data to the form desired are pre-calculated as a single constant which is printed in the appropriate place. In this way, the results can be obtained quickly with a few slide rule operations. In some cases, it is impractical to print the actual value of the factor on the card, because, for example the strength of the standard solutions used may vary from day to day. Thus, in the phosphorous analysis, the numerical value of the correct factor is inserted by the analyst.

As each phase of the analysis is completed, the results are recorded on the analysis-data card along with the date of completion, and initiated by the analyst. The data cards from these completed phases are recorded on and then attached to the master card in the file. Thus, merely by referring to one file, supervisory personnel can get in a matter of seconds the following information about any specific analytical sample: time sample received; type of sample; how much of the analysis is completed; the results and date of their completion; how much remains to be done; the individuals responsible for individual phases of the work; and, the data from which the calculations were made.

The cards illustrated were selected from a set used for the analysis of steel alloys, where the analysis is concerned with finding the percent of the various alloying elements present. However, the same system is easily adaptable to any quantitative work involving a series of analytical steps. The system can be set up simply by planning what data are needed, supplying the constants to convert this data to final results, and setting up the card in a convenient-to-calculate form.

American Standard Safety Code

For Installing and Using Electrical Equipment In and About Coal Mines

An Extract of the 1951 Revision of the Safety Rules Published in 1936, Sponsored Jointly by the American Mining Congress and the U. S. Bureau of Mines

AS explained in its introduction, the purpose of the Code is to furnish a concise edition of recommendations designed to minimize hazards resulting from the use of electrically-operated equipment in coal mines. Unless otherwise stated, each provision applies equally to both underground and surface installations but does not apply to strip mining. In the following pages certain provisions have been selected to give the industry a definite idea of how the complete standard is formulated.

General Provisions

No person shall be allowed to work on any electric circuits or equipment unless he has been previously instructed by an authorized person in the performance of his duties.

A map of the mine showing the location of all circuits and stationary electric equipment comprising the electric system shall be drawn to a scale of one in. equals 500 ft or less. It shall show by suitable designation (1) size of conductors, (2) location of circuits and equipment, and (3) capacity in horsepower, kilovolt-amperes, and voltage appropriate for each motor, generator, rectifier, and transformer. The nature of the duty of each piece of electric equipment shall also be indicated.

Electric equipment and wiring at every mine shall be inspected systematically as often as necessary to insure safe operating conditions, at least once a month. A report of each inspection shall be made by an authorized person. A copy shall be furnished to a responsible official and kept on file at the mine.

At least every six months all grounding conductors shall be inspected for broken connections, and each grounding conductor and its connection with the ground shall be tested for abnormal increase in resistance.

All stationary machines and equipment shall be tested at least every six months for open grounding connections or increase in grounding resistance or to detect the presence of grounds.

All mobile and portable equipment shall be tested at least every three months for open grounding connections or increase in grounding resistance or to detect the presence of grounds.

High voltage (i.e. above 650 v) shall not be used on portable electric equipment. High voltage may be applied to transformers and to motors for stationary equipment. The voltage applied to hand-held electric equipment, such as drills and semi-portable electric lamps, shall not exceed 300 v between conductors.

All electric equipment shall be operated within its rated temperature rise. Approved protective devices, properly set or adjusted, shall be used to prevent damage to circuits and equipment from excessive overloads and short circuits.

Approved working clearance and illumination shall be provided around all parts of stationary electric equipment to permit necessary travel, operation, maintenance, adjustment, and repairs with minimum hazard to men engaged in such work. The working space shall be kept clear of rubbish and stored materials.

Where the manipulation of, or working on or around, stationary electric equipment, including switchboards, may introduce a shock hazard, dry wooden platforms, rubber mats, or other suitable electrically nonconductive materials shall be provided for workmen to stand upon. Insulated operating sticks or equivalent shall be provided for opening or closing disconnecting switches that are hook-operated.

Except as elsewhere required or permitted by the code, all bare, ungrounded live parts of electric equipment operated at more than 50 v to ground shall be protected by one of the following means:

(a) Enclosure, with access to live parts only through opening a door or cover.
(b) Guarding — as by railing, screen, or barriers—to remove the liability of contact or approach.
(c) Isolation, by placing at least eight ft above the floor or by removing beyond ready accessibility.

Danger signs shall be posted at substations, transformer stations, and other high-voltage electrical installations to indicate the voltage classification of the equipment contained therein. Signs prohibiting entrance to unauthorized persons shall be displayed at entrances to electrical stations or enclosures.

All persons working with or around electric equipment and circuits shall be familiar with resuscitation methods, and charts showing approved methods shall be posted conspicuously in every underground and surface station as well as at the entrance to the mine.

Two or more approved fire extinguishers for use in extinguishing electrical fires in confined places shall be conveniently located and conspicuously marked in each station; in addition, adequate quantities of rock dust shall be provided in all underground stations for immediate use in extinguishing fires.

Power, Trolley and Feeder Circuits

Each power circuit leading underground shall be provided with a switch in each conductor of the circuit for visibly disconnecting the circuit from the source. This switch shall be placed on the surface not more than 500 ft from the mine entrance.

All circuits leading underground from substations and transformer stations shall be provided at their source with current-interrupting devices of such capacities and so installed and adjusted that the circuit will be opened if the current in the circuit exceeds the safe carrying capacity of the conductors leaving the stations. Three-phase, delta or Y-connected ac circuits shall be protected by a fuse or a circuit breaker in each underground wire.

The part of the trolley circuit used for surface operations shall be arranged so that it can be completely disconnected from the power supply without de-energizing the underground trolley and feeder circuits.

If the surface trolley and feeder circuits are more than 2000 ft long, sectionalizing switches shall be placed in the trolleys and feeders at intervals not exceeding 1500 ft. These switches shall be arranged so they can be locked open. A sectionalizing switch shall be provided at surface man-trip stations to remove power from the trolley circuit at such locations while men are being loaded or discharged from man-trips, unless the trolley wire at this location is 6½ ft or more above the tops of the cars or unless special covered man-trip cars are used.

Each exposed trolley or feeder circuit that leads underground shall be equipped with lightning arresters of approved type at the point where the circuit enters the mine and at intervals not exceeding 1000 ft throughout the surface system.

All power conductors in shafts shall be covered with approved insulating materials throughout or guarded in an approved manner. However, grounded conductors of grounded dc systems shall be supported on insulators but need not be covered with insulation. Shaft cables shall be so placed or protected that they will not be subject to damage from moving cages and skips, ice, coal, or other falling materials or to damage from mine water and electrolysis.

Disconnecting switches shall be installed in all main power circuits near the bottom of shafts, boreholes, and other places where these power circuits enter the mine. High-voltage disconnecting switches shall be accesssible only to properly qualified persons and shall be arranged so they can be locked open, or a danger sign must be placed on the switch by the person who opens it. Disconnecting switches also shall be provided near the beginning of all high-voltage branch circuits; they shall be located preferably in well-ventilated fireproof rooms.

It is recommended that underground power circuits be installed only in regularly inspected intake airways. Ac circuits installed in the vicinity of trolley wires shall be covered or placed so as to minimize the possibility of being struck by trolley shoes or wheels, or by other haulage equipment.

Cables for high-voltage circuits underground shall be either the metallic armored or nonmetallic sheathed type. Metallic armored cables may be supported (1) on messenger wires or (2) directly on hangers, both of which shall be suspended by means of insulators if supported in coal or on other combustible materials, or (3) they may be buried. Shielded nonmetallic sheathed cables shall be installed in metallic conduit, or they may be buried.

Unshielded nonmetallic-sheathed cables shall be installed in metallic conduit.

When conductors or cables are enclosed in metallic armor, conduit, or shields the armor, conduit, or shields shall be electrically continuous throughout and effectively and permanently grounded.

Multiconductor, insulated low-voltage cables shall be of armored construction or of nonmetallic-sheathed construction and shall be supported so that they will not be in contact with combustible material.

In trackless entries a grounding conductor shall be carried in addition to the power conductors; this conductor, however, may be uninsulated and permitted to rest on the mine floor.

Power cables buried in the mine floor shall be not less than 12 in. below combustible material; where such cables pass under mine tracks they shall be not less than 36 in. below the tracks, unless adequately protected against crushing from the weight of passing trips or heavy equipment.

Copies of the complete code, a 28-page booklet covering all phases of underground and surface electrical installations, are on sale at 20 cents each by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

All power conductors shall be covered with approved insulation throughout

Mine Circuit Protection

In every instance sufficient feeder and return-circuit capacity shall be provided to open the overcurrent protective device by a dead short circuit at the most remote point of the circuit. A typical application of overcurrent protective devices in the electrical circuits of a large mine is specified as follows:

An overcurrent protective device shall be installed in the circuit between each two substations. This device shall be installed at such a point that the resistance between each station and the device is approximately the same. If enough copper is used so that a short circuit at any place will open the devices at both substations, no intermediate protection need be installed. A sectional insulator or so-called dead-block may be used between the substations if parallel operation with other substations is not necessary for satisfactory power service. For further sectionalizing, a disconnect switch or protective device shall be placed at not more than 1500-ft intervals in every power line and also at man-trip stations. These switches shall be so arranged that they can be locked open.

An overcurrent protective device shall be used in each circuit leaving a substation. These may be fuses or circuit breakers of the manual or automatic reclosing type. (If circuit breakers are employed, trip-free operating mechanism shall be used.) Where a substation feeds the main haulage only, and only one haulage unit at one time, only one breaker is required at the station.

An overcurrent protective device shall be placed at each main branch circuit; at secondary branch circuits; at circuits to pumps or other fixed loads; and at each mining set-up. Unimportant branch circuits such as entries and spur tracks used infrequently shall have switches for cutting off all power.

During nonoperating times, power shall be cut off all idle territories. Where it is necessary to run a pump or other equipment in an idle section or inactive part of the mine special overload protection shall be provided of a capacity limited to that operation.

Wiring Installation

Wiring in places where atmospheres may become explosive because of gas, vapor, or dust shall be in rigid metal conduit with threaded explosion-proof joints and explosion-proof fittings.

Where connections must be flexible, as at motor terminals, a flexible fitting of the explosion-proof type shall be used.

No wiring shall be installed in underground explosives-storage magazines. Illumination in such underground stations must be obtained from permissible lamps.

Wiring in storage-battery charging stations underground shall be in rigid metal conduit. However, if adequate, continuous ventilation is provided by a separate split of air to prevent dangerous accumulations of explosive gases or vapors, such stations may be wired with flame-resistant nonmetallic sheathed cable.

Permanent or stationary (fixed) wiring shall not extend beyond the last open crosscut and shall be kept at least 150 ft from pillar workings.

It is recommended that power connections for portable cables of permissible equipment be made in intake air. When such connection cannot be made in intake air, permissible junction or permissible distribution boxes shall be used to make the connection.

Conductors shall be so spliced or joined as to be mechanically and electrically secure without solder and, unless an approved splicing device is used, shall then be soldered with a fusible metal or alloy or shall be brazed or welded. All joints and the free ends of conductors shall be covered with an insulation equal to that originally on the conductors.

Switches and starting boxes shall be of the enclosed type, with suitable locking devices, unless inaccessible to other than qualified persons. Switches, circuit breakers, and controls shall be so installed that they are readily accessible and can be operated without danger of contact with moving or live parts. All principal switches and controls shall be so marked that they may be found readily in an emergency. Means shall be provided to permit isolating fuses or circuit breakers from the live source.

Two-wire, ungrounded dc circuits shall be protected by a circuit breaker or by a fuse and switch in each wire. Two-wire, grounded dc circuits shall be protected by a circuit breaker or by a switch and fuse in the ungrounded wire.

Three-wire dc circuits shall be protected by a fuse or circuit breaker in each ungrounded conductor, and a switch shall also be installed to isolate the fuses or circuit breakers from live sources. It is recommended that the neutral conductor be grounded.

Three-phase, delta or Y-connected ac circuits shall be protected either by a fuse or by a circuit breaker in each ungrounded wire. When circuit breakers are used, either two or three overload trip coils may be provided for ungrounded neutral systems. In either instance the circuit breaker shall be so arranged that the opening of one phase will open the other phases simultaneously. Means shall be provided for isolating the fuses or circuit breakers from live sources.

Motor Protection

Every dc motor, together with its starting or controlling device, shall be protected as follows:

(a) Each dc motor starter shall include overcurrent protective devices. Thermal cut-outs and other devices not designed to open short circuits shall not be used for overcurrent protection of motors unless such cut-outs and devices are protected by fuses or circuit breakers.

(b) Suitable switches, circuit breakers, or equivalent devices shall be installed reasonably close to the motors for disconnecting them from the source of supply. The device need not open the grounded conductors of a circuit. A single-pole device shall not be placed in any grounded or neutral conductor. These devices shall be so placed in the circuit as to permit fuses to be isolated from the live source for removal. If two-pole circuit breakers are used, they shall be arranged to open both poles simultaneously.

Three-phase, delta and Y-connected motors shall be protected in each ungrounded lead against excessive overload by a fuse or circuit breaker. When circuit breakers are used, two or three overload trips shall be used for ungrounded neutral systems, and three overload trips shall be used for grounded neutral systems. In either instance the circuit breaker shall be so arranged that the opening of one phase will also open the other phases simultaneously.

Means shall be provided for isolating fuses or circuit breakers from live sources.

A motor and the machinery it drives shall be within sight of the control, unless provision is made for locking the controller or other disconnecting means in the open position.

Motors shall be equipped with controls having low-voltage protection or low-voltage release.

For stopping motors in emergencies, a switch or other suitable means shall be installed near the machines driven by the motors.

Electric machines and devices operated in by the first open crosscut between entries or rooms or in air that has ventilated one or more working places in mines classed as gassy shall be permissible except that explosion-tested, cable-reel locomotives and cable-reel shuttle cars may be used. No electrically-driven machine, either permissible or nonpermissible, shall be taken into or operated in any place where one percent or more methane, not less than six in. from the roof, face, or rib, can be found by analysis or other recognized means of detecting methane.

Where there is danger of the accumulation of gas or of explosive coal dust in suspension, electric haulage by trolley-pole-type locomotives shall not be permitted. This restriction shall apply to all types of gathering units operating from the trolley wire.

Gathering locomotives may be operated in a nongassy area with a single-conductor cable if one or both rails of the track are bonded; otherwise, double-conductor cable shall be used. If gathering locomotives are operated in gassy areas, they shall be equipped with a two-conductor cable, and the electric circuit shall be insulated from the frame of the locomotive. The cable of gathering locomotives shall be provided with an approved trolley tap with an insulating handle or an equivalent device for making connection safely to the trolley or feeder wire. This device shall be equipped with a circuit interrupter of suitable capacity for short-circuit protection of the cable.

Belt Conveyors

Control switches shall be placed along the belt line at such intervals as may be necessary to permit quick stopping of the conveyor in emergencies.

All emergency switches that control movement of the conveyor belt shall be designed so that when the belt is stopped by a given emergency switch that switch must be restored to its running position before the conveyor can be started again.

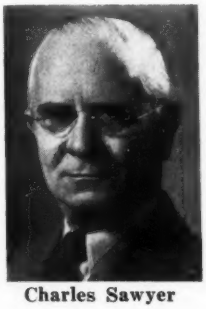
Conveyors shall be equipped with control switches to automatically stop the driving motor in the event that the belt is stopped by slipping on the driving pulley, breakage, or other accident.

To protect men riding conveyor belts, red signal lights shall be placed 50 ft from intermediate loading stations and the discharge station.

Adequate clearance space and illumination shall be provided at points designated for men to get on and off belts.

AMC Personals

Election of former Secretary of Commerce **Charles Sawyer** as a director of Kennecott Copper Corp. has been announced by Charles R. Cox, president. In addition to extensive experience in business and the practice of law, Sawyer has had a long and distinguished career in public service. For the past five years he has been Secretary of Commerce. In 1944 and 1945 he served as Ambassador to Belgium and Minister to Luxembourg. He was Lieutenant Governor of the State of Ohio in 1933 and 1934.



Charles Sawyer

C. Ward Padgett was appointed general superintendent of the Zeigler and Buckhorn properties of the Bell & Zoller Coal & Mining Co. in December. Padgett became associated with Bell & Zoller in 1948 and has been general superintendent of that company's West Kentucky properties. Before that he was with the Crescent Coal Co. at Central City, Ky.

Robert P. Koenig, president and director of the Cerro de Pasco Corp., has been added to the board of directors of the Empire Trust Co. Koenig was president of Ayrshire Collieries Corp. before joining Cerro de Pasco in 1950.

Bill Meakin, ventilation engineer with Eastern Gas & Fuel Associates, has left that company to join Joy Manufacturing Co. as mine fan application engineer.

Wm. P. Snyder, Jr., president of Snyder Mining Co. at Pittsburgh, Pa., has announced that **Odin A. Sundness**, of Duluth, Minn., was elected a vice-president in charge of mining operations of the company's Minnesota properties. Sundness has been associated with the Shenango Furnace Co. and Snyder Mining Co. since 1911. During these years he has filled the positions of chief chemist, chief mining engineer, and general superintendent on the Mesabi Range. He has been general manager of operations since August, 1946.

President Alexander C. Brown announced that **Raymond John Wean,** president and director of the Wean Engineering Co. of Warren, Ohio, was elected a director of The Cleveland-Cliffs Iron Co. at the January meeting of the Board of Directors. He succeeds the late W. H. Gerhauser, formerly president of The American Ship Building Co., and a director of Cleveland-Cliffs from 1948 until his death on November 23, 1952.

The steel sheet, tinplate and strip mill equipment manufactured by the Wean company, which R. J. Wean organized, developed and heads, is used in mills all over the world. Besides having all the qualifications of a corporation executive, Wean's forte is the inventing and designing of mechanical equipment, particularly for the steel industry.

Francis O. Case has been elected president of the Glen Alden Coal Co. The presidency of that company has been vacant since October, 1951. Case comes to Glen Alden from the Anaconda Copper Mining Co. He has been a vice-president of that company since 1949 and last year was named president of a subsidiary, Anaconda Aluminum Co.

Robert D. O'Brien has resigned his position as manager of Highland-Surprise Consolidated Mining Co. **Henry C. Smith,** vice-president of the company, has temporarily been placed in charge of operations at the company's Pine Creek property. O'Brien had been manager since 1950.

West Kentucky Coal Co. recently announced the election of **Cyrus S. Eaton,** chairman of the Portsmouth Steel Corp., as a director.

Climax Molybdenum Co. has acquired two new officials, according to recent, separate announcements. **Weston G. Thomas** has been elected a vice-president of the company. He is also a director and treasurer of Climax. **Louis S. Dietz, Jr.,** has been appointed technical advisor to the Molybdenum Co. For the past 23 years Dietz has been associated with Western Electric and its affiliate, Nassau Smelting & Refining Co.

The appointment of **Gordon M. Davie** as controller of the Chicago, Wilmington and Franklin Coal Co. has been announced by George B. Harrington, president.

Don Wilson has been named assistant foreman of the Bunker Hill Sullivan mine. He replaces **Robert Haffner,** who has resigned to accept a position in the Tri-State district.

William B. Young, formerly with Defense Solid Fuels Administration, has joined the U. S. Bureau of Mines, Region IX as project engineer effective February 9. He is temporarily assigned to the Washington office but expects a foreign assignment in the near future.

Louis D. Gordon, known as the "Father of Round Mountain" has been appointed executive secretary of the Nevada Mining Association (formerly the Nevada Mine Operators' Association). His insight into the problems of mining, gained in Nevada, Utah and California as a practical mining man and long time member of the Executive Committee of the Association, made him the logical successor to the late Henry M. Rives.

Louis D. Gordon

Vice-President Vern Murray of the Union Pacific Coal Co. recently announced the retirement of **Hodge Burress,** superintendent of the company for ten years. **Julius Reuter,** assistant superintendent, succeeded Burress.

Anaconda Copper Mining Co. has announced the promotion of four of its staff at the Great Falls, Mont., Reduction Works. **Thomas K. Graham** is the new assistant general superintendent of the reduction department; **Guy T. Wever** is superintendent of the electrolytic zinc department; **Clarence V. Saylor** is now assistant superintendent of the copper refineries; and **Charles R. Hill** is acting assistant mechanical superintendent.

J. L. Mealy, former sales manager of the Thompson Phosphate Dept. of International Minerals & Chemical Corp., has been appointed sales manager, direct application, rock phosphates, George W. Moyers, vice-president in charge of International's Phosphate Div., announced.

Norman A. Stockett, after 36 years in mining and milling has retired from his position as general mill superintendent of the Southeast Missouri Division, St. Joseph Lead Company. Stockett is a graduate of Montana School of Mines—'09 and was awarded "The Professional Degree of Engineer of Mines" in 1951. Before joining St. Joe in 1916, he had worked at Butte, in Ontario, British Columbia and the Coeur d'Alenes. He was active in professional societies and was chairman of the St. Louis Section AIME in 1948. Last year he spoke at the AMC Denver Convention.

Norman A. Stockett

E. R. Price, manager of coal properties for the Inland Steel Co., has announced two recent promotions. **J. T. Parker**, superintendent coal properties, became general superintendent, and **E. M. Pace**, mining engineer, was named mine superintendent of the Wheelwright and Price mines. The changes were made on January 1.

S. S. Goodwin, manager of mines of the New Jersey Zinc Co., has been elected a vice-president of the company, with headquarters in New York. After attending the University of Kentucky, Goodwin worked for the Kentucky Geological Survey and then took graduate work in geology at the University of Cincinnati. Following this he became affiliated with what is now the Bertha Mineral Division of the New Jersey Zinc Co. at Austinville, Va., where he rose in 17 years to the position of superintendent. In 1947 he was transferred to New York and the following year he was made assistant manager of mines. He became manager of mines in 1950. As vice-president, Goodwin will be responsible for the mining and exploration operations of the company, retaining his title as manager of mines.

Ben H. Schull has been appointed director of the Illinois Department of Mines and Minerals by Governor William G. Stratton.

E. M. Stiles, for 30 years chief engineer of Consolidated Mining and Smelting Co. of Canada, Ltd., retired from that position at the beginning of this year. He will become consulting engineer of the firm's engineering division. **J. V. Rogers**, assistant chief engineer, will take over the newly created position of manager of the engineering division. **W. K. Gwyer**, assistant superintendent of construction, has been given the new post of assistant manager of the engineering division.

James M. Parsons has been elevated from section boss to assistant general foreman and **George Thore** from mechanic to mechanical foreman at the Keystone mine of Eastern Gas & Fuel Associates.

W. S. Phillips has been promoted from chief engineer to mine superintendent of the Holden Mine, Howe Sound Co., Chelan Division.

The U. S. Bureau of Mines has announced the promotion of **Harry F. Weaver** from assistant chief to chief of the Coal Mine Inspection Branch, Health and Safety Division.

Texas Gulf Sulphur Co. has announced that **Herbert E. Treichler**, vice-president and general manager, has relinquished his duties as general manager. He will continue as vice-president. **Harry A. Swem** has been elected a vice-president of the company. He also will be manager of production.

—*Obituaries*—

Zack Justice, president of the DJB Coal Co., died January 12. Mr. Justice was a director of the Williamson Coal Operators Association and had for years been active in local association work.

George M. Blair, 61, died December 21 at Murray, Utah. He helped develop the Rexall mine at Alta, Utah.

Edwin Guy Kidder, 79, died December 20 of injuries following a fall. He resided in Salt Lake City and was secretary of the Arizona Antlers Mining Co.

Francis A. Bell, a vice-president of the Cleveland-Cliffs Iron Co., died in early December in Cleveland, Ohio, after a month's illness. Mr. Bell joined the Cleveland-Cliffs Iron Co. in July, 1952.

Ernest A. Prudent, general superintendent of the Zeigler No. 3 and Buckhorn mines of Bell & Zoller Coal & Mining Co., died in December of a heart attack.

Earl MacIntyre, 64, died in Salt Lake City, Utah, recently after a year's illness. He was widely known in Utah mining circles and was president of the Mammoth Mining Co.

Lawrence Christopher Doheny, Alaskan mining engineer, died at his home in Anchorage, Alaska, early in December. Doheny was active in the mining world in interior Alaska. For several years he was employed by the U. S. Smelting Refining and Mining Co. in the Fairbanks area. During World War II he was Reconstruction Finance Corp. representative in that area.

Walter L. Maxson, 60, vice-president in charge of research for the Oliver Mining Division of United States Steel Corp., died January 8 in Bellingham, Wash. He was on a vacation from his duties as director of Oliver's taconite development program. Mr. Maxson was recognized as one of the world's foremost men in metallurgical research, with a wide knowledge of raw materials and beneficiation. In addition to his work with Oliver, he was a member of the Atomic Energy Commission as a consultant on the raw materials committee.

George R. Weber, vice-president, treasurer and a director of Raybestos-Manhattan, Inc., and general manager of its U. S. Asbestos Division plant at Manheim, Pa., died January 14 at his home in Lancaster, Pa.

John E. Biggs, Jr., 52, died in Palm Beach, Fla. Mr. Biggs was president and general manager of the Feds Creek Coal Co., Inc. of Kentucky and the Harman Coal Corp. of Virginia.

Fred J. Bailey, a pioneer in the field of mine safety and one of its best known people, died at his home in Benton, Ill., on January 16. Mr. Bailey started his career in the coal industry in the Pocahontas coal mines near Bluefield, W. Va. He then went with the Bureau of Mines and later joined the Cardox Corp. of Chicago, with whom he was employed at the time of his death. He was well known in coal mining circles and has long been associated with the advancement of safety in mining.

Charles J. Parry, manager of the mining department of J. A. Hogle & Co., died in Salt Lake City recently. He had been associated with J. A. Hogle & Co. for 28 years and was well known throughout the mining industry.

Maj. William W. Inglis died in Scranton, Pa., on January 19. Maj. Inglis' connection with the anthracite industry dated back to 1884 when he entered the employ of Hillside Coal and Iron Co. In 1929 when the Glen Alden Coal Co. was organized, he was made president and served in that capacity until his retirement in 1946. He served as a member of Anthracite Operators' Wage Agreement Committee from 1922 to 1947 and chairman from 1925 on.

Wheels of GOVERNMENT

AMC

As Viewed by HARRY L. MOFFETT of the American Mining Congress

THE tempo of activity within the 83rd Congress stepped up after President Eisenhower and Capitol Hill leaders scheduled the principal features of the Administration's legislative program for the coming months. Congressional Committees are currently holding hearings on such major matters as appropriations, revision of the Taft-Hartley Act, submerged lands, and economic controls. Meanwhile, plans are being laid for a host of investigations—into the conduct of the national defense program and into many facets of the administration of the Government departments and agencies during the past several years.

Even at this early date, optimistic forecasts are forthcoming from Administration sources in Congress that the national lawmakers may be able to adjourn by early July.

Ike's Program Revealed

Following delivery to the Congress of his State of the Union message, the President conferred with members of his Cabinet and party leaders and came up with an 11-point legislative goal. This schedule, in addition to continuation of Government reorganization authority, calls for appropriations measures to reach the White House by late May or early June; the admission of Hawaii as the 49th State; revision of the Taft-Hartley Act; extension of materials controls, priorities and allocations to take care of the needs of the defense program; return of the tidelands to the States; extension of the Reciprocal Trade Agreements Act; customs simplification; broadened Social Security coverage; extension of further aid to the nation's schools, and revision of the District of Columbia government.

In announcing these goals, Senator Taft (Rep., Ohio) and House Speaker Martin (Rep., Mass.), made it clear that the list was subject to further expansion.

One of the goals was achieved quickly when both the House and Senate snapped through a measure giving President Eisenhower power to revamp the Executive Branch of the Government, subject only to veto by a "Constitutional majority" of the full membership of either House. In the early stage of its consideration the bill had been amended to permit either House to override a Presidential reorganization plan by a mere majority of those present, but this amendment was knocked from the measure at the request of the Administration.

Tax Reduction Snarled

Somewhat of a "snafu" has developed over tax reduction. Despite the avowed declaration of Administration spokesmen, both in and out of Congress, that tax cuts should await a more clear picture of the budget outlook, Chairman Reed (Rep., N. Y.) of the House Ways and Means Committee successfully charted his measure, slashing personal income taxes by about 5½ percent in the present year and about 11 percent in 1954, through the Committee by a 21 to 4 vote. The Committee backed him up with a strong report stating that tax reduction should come before budget balancing.

The future course of the bill in the House is uncertain. Rep. Leo Allen (Rep., Ill.), Chairman of the powerful House Rules Committee, through which all bills must be cleared for floor consideration and which can limit debate and amendments, has stated that the tax reduction measure will be placed in "cold storage" until at least May 1. Reed may, of course, take the bill to the floor as a privileged measure but this would subject it to unlimited debate and unlimited amendment.

In the Senate, a conservative sentiment holds sway. Members of the upper House are inclined to wait and see what can be done to bring about a balanced budget before moving on to tax cuts.

Also in question is the expiration of the excess profits tax which, under existing law, is due to die on June 30. In the past few weeks there has been an increasing chorus from leading officials declaring that this tax should not be allowed to expire if the budget cannot be balanced, unless it is replaced by other revenue-raising provisions.

Meanwhile, many moves are being made in both chambers to trim the gigantic Federal budget. Appropriations Committees are scrutinizing all requests thoroughly and have already pared many millions from proposed expenditures. Legislation has been proposed calling for the establishment of a joint House-Senate Committee on the Budget, to be charged not only with slicing budget requests, but with acting as a watchdog over the expenditure of funds that have been appropriated.

Labor Law Hearings Open

Both the House and Senate Labor Committees have launched hearings on proposed revisions of the Taft-Hartley Act. A steady stream of witnesses have called for a wide variety of changes in the law, ranging from minor technical amendments to outright repeal of the Act and return to the Wagner Act. The numerous measures introduced in both chambers also range from further strengthening of the law to its removal from the statute books.

Chairman McConnell of the House

Washington Highlights

LEGISLATIVE PROGRAM: Scheduled.

TAX REDUCTION: Awaits budget balancing.

LABOR LAW: Revision under study.

COPPER DUTY: Suspension continued.

FOREIGN OIL: Quotas sought.

ECONOMIC CONTROLS: Being rapidly removed.

L-208: Before Court of Claims.

Labor Committee has said that that committee will study the operation of the entire Act and its administration, and will then draft a bill after all the testimony of industry, Government and labor is in. On the Senate side, the hearings are also being given over to the views of all parties interested in the law and particular attention is being focused on proposals by Senator Taft. These, among other things, would increase the size of the NLRB, make the NLRB general counsel independent of the Board, eliminate any requirements for employers to check off union fines or assessments, remove the requirement for joint union-management control of welfare funds and make them subject to Labor Department approval, revise the secondary boycott provisions, establish an Advisory Commission to watch over the Act's administration, and make both employer and union officials file non-Communist affidavits.

Members of Congress, labor leaders and industry spokesmen are currently voicing their views on the Act. Representatives of labor have strongly opposed any attempts to strengthen the present law, and called for revisions designed to place more power in the hands of labor unions. Industry officials, on the other hand, have pointed out many inequities in the law with respect to employers and have called for strengthening the law in this direction.

Copper Duty Suspended

The first measure to clear the House in the current session was a bill by Rep. Reed (Rep., N. Y.) providing for the continued suspension of the 2-cents-a-pound copper import tax until June 30, 1954. The bill became law on February 13.

Although the measure sped through the House, it was the subject of considerable debate in the Senate, with strong objections being voiced to the two-price system in existence for copper. Leading Senators also condemned past governmental policies which have retarded domestic mineral and metal production. Pleas were advanced for sound tariff policies to protect the American mining industry from the products of foreign mines.

During the course of the Senate debate, Senator Ed Johnson (Dem., Colo.) introduced a bill which he said would provide a steady supply, at stable prices, of strategic and critical metals and minerals from domestic mines, and insure an active, healthy mining industry within our borders. His measure would create a Metals Credit Corporation to (1) purchase unspecified quantities of domestic strategic and critical metals and minerals at prices not less than their average cost of production in the U. S.; (2) stockpile appropriate quantities after securing the necessary refining or processing through normal commercial channels; and (3) sell its metals and minerals either before or after stockpiling to U. S. industrial users at prices not less than their acquisition cost.

Fuel Import Quotas

Also on the tariff front, sentiment is steadily mounting in Congress for limiting imports of residual fuel oil. A large number of members have sponsored measures calling for restricting imports of foreign residual oil to no more than 5 percent of the domestic demand in the corresponding calendar quarter of the previous year.

In placing these bills in the legislative hopper it was pointed out that competition from residual fuel oil produced abroad has been responsible for a decline of 6½ percent in bituminous coal production in the United States. These imports have been responsible for a loss of $75 million annually in the wages of coal miners and at least $40 million in the wages of railroad workers.

Support for these measures is coming from all segments of the coal mining industry, the railroads and labor unions. Prospects for passage are considered fairly bright, according to seasoned observers on Capitol Hill.

Economic Controls Lifted

The new Administration is moving fast to remove burdensome price and wage controls even before their legal expiration date. First to be lifted were wage and salary controls. Following on the heels of this action were a series of orders from the Office of Price Stabilization, lifting price controls from the major share of commodities previously subject to ceiling restrictions.

Of particular interest to the mining industry were orders removing price controls from almost all metals and minerals, fuels, cement, and mining machinery.

This flow of decontrol orders is a prelude to the liquidation of the emergency agencies.

Meanwhile, the Senate Banking and Currency Committee has initiated hearings on a measure by its Chairman, Senator Capehart (Rep., Ind.) which would continue price and wage controls on a standby basis, to be invoked by the President in time of an emergency.

The President has made it clear that he does not expect to ask for any extension of price and wage control authority after April 30, but will seek continuation of materials priority and allocation powers to meet defense requirements. He has also indicated that an extension of the loan and grants authority provided in the Defense Production Act will be sought. It is believed likely that the Congress will continue these powers to provide funds for mineral exploration and development and to make expansion loans and long term purchase contracts.

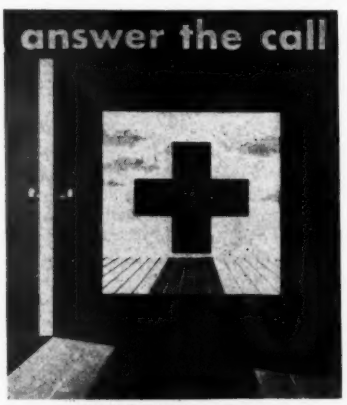
As a corollary to the price and wage actions, the Controlled Materials Plan has been modified so that producers of steel, copper and aluminum may, after they have honored CMP tickets, use additional space in their plants for any customer, without further reference to the Government.

L-208 in Court of Claims

Extensive hearings have been held before Commissioner William Day of the U. S. Court of Claims on the wartime gold mine closing order, L-208. Events leading up to the issuance of the order and the hardships experienced by gold mine operators were thoroughly aired.

Sixteen gold mining companies and individuals are joined in the case, and evidence for the group was placed before the Commissioner by attorneys for the Homestake Mining Company. The record of the hearings indicates that the mining companies have presented an excellent case to the Court, showing that the WPB order was issued primarily as a means of making additional manpower available to other branches of the mining industry rather than as a means of saving critical materials. The companies pointed out that, as a manpower measure, the order was unenforceable and that no attempt was made to enforce it. They also presented evidence to show that not more than 100 gold miners had transferred to the nonferrous mining industry and remained there for more than a year as a result of the order.

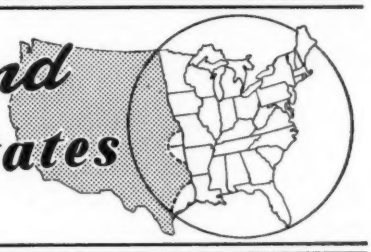
The evidence received by Day will be presented to the Court of Claims later this year, and the Court's ruling will determine the extent of Government liability resulting from the L-208 order.



1953 Red Cross Fund

NEWS and VIEWS

Eastern and Central states



Wins Freedoms Award

Stanley B. Johnson, president of the Lorain Coal & Dock Co. and the Lorado Coal Mining Co., Columbus, Ohio, received a second place award from Freedoms Foundation, Valley Forge, Pa., for outstanding contribution to a better understanding of the American Way of Life during 1952.

Johnson's award was received in the editorial category for his President's Corner "The Strength of Our American Way," which appeared in the March, 1952, issue of the Company's employe publication, *The Lorain-Lorado Journal*.

This is the second time Johnson has been honored by the Freedoms Foundation. His President's Corner, "Faith of our Fathers" won an award in 1950. The *Lorain-Lorado Journal* also won an award in the company employe publication category in 1950.

Foremen Get Safety Awards

Consolidation Coal Co., (Ky.) Division of Pittsburgh Consolidation Coal Co., made awards to 78 foremen for achieving the best safety record in the history of the company during 1952. The awards were presented by G. O. Tarleton, vice-president, during the company's annual safety meeting at Boiling Springs Country Club at Jenkins, Ky.

Three foremen received portable radios for having worked nine years without a lost-time accident. Nine foremen who had outstanding records over a period of five years received engraved pocket watches. Watch fobs and suits were awarded men with six-year records. Lapel buttons were presented 64 foremen with good safety records of from one to four years.

Coal Property Sold

According to a recent announcement, the Logan (West Virginia) property of the Georges Creek Coal Co., Inc., has been sold to the Crystal Block Coal & Coke Co.

Safe Year For Coal

Bituminous coal mining had its safest year in history in 1952, according to preliminary figures of the U. S. Bureau of Mines. The number of fatalities was the lowest on record as was the fatality rate of only 0.82 deaths per million man-hours worked.

Bureau Director J. J. Forbes, in reviewing the 1952 record, gave credit to the operators, state mining officials, and mine workmen for their share in setting the all-time records for safety. Fatality rates in coal mining have shown a general downward trend since 1940, he said, when the rate was 1.85 deaths for every million man-hours worked, more than double last year's record low. The number of fatalities in bituminous mines in 1952 totaled 443.

"The gratifying reduction in the number and rate of coal-mine fatalities," Director Forbes said, "is cause for satisfaction but not complacency." At the same time he warned against relying on legislation as an accident cure-all.

Annual Zinc Meeting

The American Zinc Institute has announced that its Thirty-Fifth Annual Meeting will be held at the Hotel Statler, St. Louis, Mo., on Monday and Tuesday, April 27 and 28.

Competent speakers will discuss topics of vital interest to the zinc industry. A review of the production picture here and abroad will bring up-to-date information to the audience. Current and new developments in the zinc markets will be among the important subjects on the program.

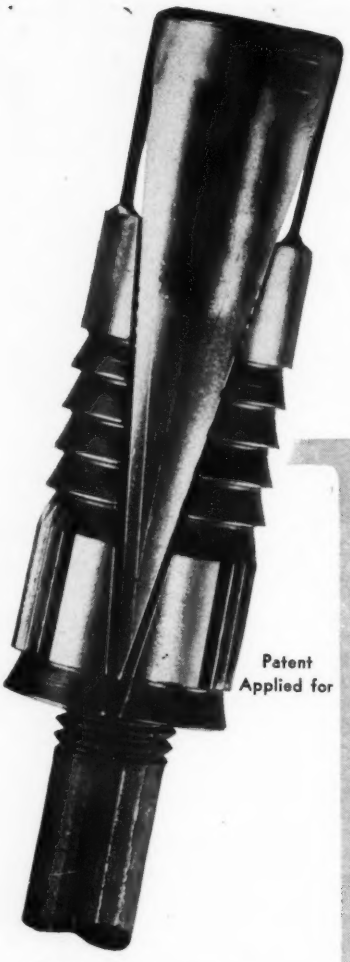
The annual dinner and smoker will be held on Monday evening, April 27.

Positions Open

DESIGN ENGINEER for plant layout and structural design work on mining and ore handling facilities. Permanent position in Pennsylvania with mining department of large steel company. Salary open. Applicants should be college graduates or equivalent with experience.

MECHANICAL ENGINEER, college graduate, for design and office engineering position with a large mining organization. Location Eastern Pennsylvania. Salary open. Applicant must have practical experience with equipment used in the mining industry and should be a competent draftsman.

Address all replies to Box 219 in care of this publication.



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W. Va. Miners Meet

The Kanawha Valley Mining Institute, Inc., held its annual election of directors on January 9. New officers of this group are: J. A. Willis, Jr., vice-president of Coalburg-Kanawha Mining Co., president; W. B. Devaney, comptroller of Cannelton Coal & Coke Co., first vice-president; H. A. Jones, general superintendent of Carbon Fuel Co., second vice-president; and M. L. Alley, general manager, Gauley Mountain Coal Co., third vice-president.

C&H Moves to Chicago

Calumet & Hecla, Inc., has taken executive office space on the 20th floor of the People's Gas Building, 122 South Michigan Ave., Chicago, Ill. Responsibility for operating mines and plants will remain decentralized in the hands of resident managers.

Foreign Coal Visitors

A group of 14 Austrian coal mining experts recently visited the United States under the joint auspices of the U. S. Mutual Security Agency and the Austrian Productivity Center. The team included a representative of the Austrian Federal Bureau of Mines, mining engineers and management and labor leaders. Purpose of the trip, which lasted for more than six weeks, was to study American coal mining methods for application, wherever feasible, to coal mining in Austria.

Austria's coal is primarily lignite. As a rule the seams, which are frequently displaced or shattered, lie much deeper than do coal seams in the United States. The Fohnsdorf mine for example is presently operating under more than 3000 ft of cover. The rock temperature is approximately 107° F.

At times it is difficult to assess the results of visits such as this in cold, technical terms. Perhaps the most important result was, as one of the team members put it, that they breathed American air; they lived in the American atmosphere; obtained an insight into labor-management relations; saw American miners at work and in their homes. They saw democracy working and working well.

Uranium Search in Pa.

Airborne radiometric reconnaissance is being carried on by the Atomic Energy Commission in the vicinity of Mauch Chunk, Pa. The purpose of the survey is to measure the amount and extent of radiation in the air as a clue to the extent of uranium mineralization in the ground below.

Flights are being carried on under contract to AEC by Safair Flying Services, Inc., of Teterboro, N. J.

Uranium mineralization has been known in the Mauch Chunk area since 1874 but was not studied until 1908 when the uranium mineral was identified as carnotite. Recently, additional occurrences have been noted. The airborne survey will assist AEC's Division of Raw Materials in determining whether further exploration in the area is warranted.

Government announcement of airborne operations came a month after the Lehigh Coal and Navigation Co. announced they would sink a test mine shaft at Mauch Chunk. For two years Lehigh has been conducting its own search and has sunk a number of small shafts in search of the mineral. Renewed interest in the area came when a recent road cut exposed deposits of carnotite.

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Labor Relations Program

(Continued from page 28)

To revert to the theme of reducing the role of the Federal Government in labor-management relations, attention is called to the constant demands of labor for Federal intervention in disputes that have arisen during the post-Korean emergency period. The reference is to intervention by temporary boards created under the Defense Production Act, such as the WSB, and not the exercise of powers under the Taft-Hartley Act.

WSB Created Chaos

When defense production legislation was first before us in 1950, Congress attempted to prevent the bypassing of permanent agencies in labor disputes cases, except under very circumscribed conditions. Constant pressure by big labor organizations, however, resulted in the President's conferring dispute powers upon the Wage Stabilization Board, thus thwarting the Congressional will. The Board which the President appointed was over-balanced on labor's side, and with the sweeping powers that it chose to exercise, it created such near chaos in labor-management relations that Congress was compelled to take remedial action. My amendment, which was adopted by the House and accepted in revised form by the Senate, deprived the WSB of its dispute authority and returned such affairs to more nearly unbiased hands. It is unfortunate that this did not take effect sooner, for, among others, mining companies were victims of warped decisions in favor of labor monopolists.

Be On Guard

Immediate threat of complete control of labor-management relations by the Federal Government has now been forestalled by a recent amendment to the Defense Production Act depriving the WSB of its disputes authority. Nevertheless, all American citizens should be constantly on guard against attempts, which will no doubt be made in the future either to reactivate the WSB in the dispute field or to create a like agency with similar powers.

Never again should we allow to be thrust upon an unwilling American society such an unjust system of determining the economic rights of American citizens. This sad page in American history must never be rewritten. On the contrary, all our efforts should be directed toward returning disputes to their proper place, the bargaining table, with as little intervention as possible by the Federal Government.

Join AMC Staff

John R. Arant

Henry I. Dworshak

D. Michael Perry

Three able men have joined the staff of the American Mining Congress —John R. Arant, Henry I. Dworshak and D. Michael Perry. They bring with them broad and varied backgrounds of experience in mining and Governmental affairs.

A native Nevadan, JACK ARANT attained a close knowledge of mining while working in tungsten properties in his home State. He comes to the Mining Congress after having served as a legislative assistant to Senator Pat McCarran, a post in which he became thoroughly familiar with the industry's problems. During World War II he served with distinction as a fighter pilot in the Southwest Pacific and later headed the Air National Guard in Nevada. He studied law at the Washington College of Law in the District of Columbia.

HENRY DWORSHAK was reared in Idaho and over the years has developed a broad understanding of mining. Educated in Idaho schools and at the University of Idaho, he became the editor of the Burley, Idaho, "Bulletin" at an early age. He entered the Army Air Force shortly after Pearl Harbor and saw overseas service in Europe. Following his return he served for a time with the Veterans Administration, and then as press secretary to the senior Senator from Idaho, where he maintained contact with the mining industry of the Northwest. He left the latter post to become vice-president of the Intermountain Tractor Sales Corp. in Salt Lake City.

MIKE PERRY, a native of Carbondale, Pa., and the son of a coal miner, brings to the American Mining Congress years of experience on Capitol Hill and in industry public relations. Over a period of eleven years he served as secretary to various members of Congress and administrative assistant to the Clerk of the U. S. House of Representatives. He was for several years on the staff of a large national trade association and is thoroughly acquainted with the problems of industry representation before Congress and Governmental departments and agencies. He is a graduate of the University of Toronto and Benjamin Franklin University.

Gold Mining Cases

Hearings were resumed on January 26 in Washington, D. C., in the suits brought by a number of gold mining companies for recovery of damages caused by the 1942 Order L-208 of the War Production Board. These hearings were begun in Seattle, Wash., last November.

Conducted by Hon. William E. Day, Commissioner of the Court of Claims, current hearings cover testimony submitted in behalf of Homestake Mining Co., Central Eureka Mining Co., Idaho-Maryland Mines Corp., Ora Fina Consolidated Mines and a group of ten companies headed by Bald Mountain Mining Co., Inc.

The enactment by the 82nd Congress of Senator Pat McCarran's bill, P. L. 532, extended to July 14, 1953, the limitation on the time within which other gold mining companies affected by L-208 can file suit.

The hearings in Washington are being reported by the Draper Reporting Co. of 727 19th St., N. W., Washington 6, D. C. Copies of the pleadings filed with the Court of Claims and copies of the transcripts are available.

R & P Sells Cambria County Mines

Rochester & Pittsburgh Coal Co. has disposed of its property in Cambria County, Pa. Included in the sale are the old Renglo mine of R & P, approximately 1144 acres of land, coal rights, rights-of-way, easements, licenses, privileges, consents and leases. Renglo mine has been idle since last November when high production costs forced its closure.

The Kovalchick Salvage Co., purchaser of the property, has no definite future plans for its new acquisition.

Anthracite Men Meet in May

Latest developments in the distribution, utilization, economic and hygienic aspects of anthracite will be subjects for the 11th annual Anthracite Conference set for May 7 and 8 at Lehigh University. Assisting Dr. Robert T. Gallagher in planning for the conference is Dr. Raymond C. Johnson, vice-president of the Anthracite Institute, Wilkes-Barre, Pa.

The conference, sponsored by the Anthracite Institute and Lehigh University, is designed to bring engineers, educators, operators and retail dealers as well as the general public up to date on the technological progress in Pennsylvania's hard-coal industry.

Serving as members of the planning committee are representatives of educational institutions, research groups, anthracite operators and retailers. Speakers will include government officials, manufacturers of heating equipment, safety directors, and mining engineers.

500,000th UMW Fund Patient

Elmer Hassenflug of Portage, Pa., was the 500,000th patient admitted to a hospital under the United Mine Workers welfare and retirement fund established in 1946. The 52-year-old miner underwent a heart operation in the University of Pennsylvania Hospital.

Receive Management Awards

According to Jackson Martindell, president of the American Management Association, Lehigh Coal and Navigation Co. and Pittsburgh Consolidation Coal Co., both Pennsylvania firms, have been awarded Certificates of Management Excellence for 1952. Only 330 of 3000 firms, in the United States and Canada, were eligible.

This is the third award for Pittsburgh Consolidation Coal Co. and the second for Lehigh Coal and Navigation Co.

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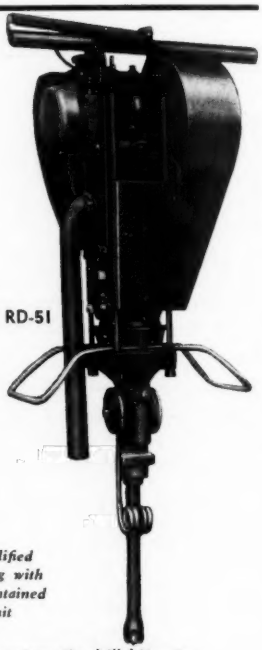

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Coal Men Go To Burma

Pierce Management, Inc. has contracted with the Government of the Union of Burma for drilling and exploration work on the Kalewa Coal Property. Four engineers will shortly leave for Burma to execute the program.

Pierce engineers are also in charge of the Viet-Nam Government Survey of American stripping methods and are conducting four Viet-Nam engineers to various mining fields.

Wisconsin Lead-Zinc Output

Lead and zinc output in Wisconsin increased 55 and 28 percent, respectively, in 1952. These increases were attributed chiefly to output from new operating mines, and relatively continuous operation by Vinegar Hill Zinc Co., and Calumet & Hecla, Inc., largest producers of the two metals in the state. Lead production in the state was 2153 short tons valued at $688,960 and zinc output was 20,167 short tons worth $6,655,110.

Second Jasper Program Begun

President Alexander C. Brown announced that the Board of Directors of Cleveland-Cliffs had approved a program for the development of low grade ore at the Republic Mine in Michigan.

This is a second project to mine and concentrate Michigan's iron bearing jasper and parallels the taconite program in Minnesota. The first operation designed to concentrate deposits of hematite jasper in the Upper Peninsula of Michigan was started early in 1951 by the Cleveland-Cliffs Iron Co. and the Ford Motor Co. in a joint operation at Humboldt, Mich. It is estimated that production will start early in 1954 at this plant.

The Republic operation will take place in Republic, in the southwest part of the Marquette Iron Range. The new Republic open-pit and concentrating mill will provide a substantial payroll for the area when an initial annual production of 400,000 tons of concentrates is reached. Additional units will be built later to materially increase annual production.

Construction of the concentration plant is expected to begin early this year. A railroad line has recently been pushed into the valley behind the high bluffs of jasper by the Lake Superior & Ishpeming R.R. to facilitate the entry of construction equipment and materials to build the mills which will house the ore dressing machinery.

Proposed plans call for the construction of two concentrating units, each capable of producing 200,000 tons yearly of iron ore concentrates. It is expected that production will be

forthcoming at Republic by mid-year 1955.

The Cleveland-Cliffs Iron Co., in order to supplement reserves of high grade commercial ores of the Marquette Range, instigated research for the solution of the problem of producing merchantable iron concentrates from the red jasper of the Marquette Range. Cleveland-Cliffs' metallurgists solved this problem by successfully formulating processes to liberate the fine particles of hematite from the worthless rock of the jaspers and by skimming the particles as concentrates to be agglomerated later.

This Republic program is the result of a policy early established by the company to perpetuate the Lake Superior Region as a source of iron ore for America by perfecting methods and processes for utilizing low grade iron bearing rock.

The old Republic Mine, which was opened in 1871 as an underground mine, was noted during its productive years for its high quality, hard lump ore. The mine reached a depth of 2910 ft and 8,563,170 tons of ore were shipped from the Republic property. When Cleveland-Cliffs acquired the property, John M. Bush, later manager of the Land and Lumbering Department of Cleveland-Cliffs, was its first superintendent and C. J. Stakel, chairman of the County Road Commission and formerly general manager of Cleveland-Cliffs' Mining Department, was superintendent of this mine in its latter operating days.

The new Republic Mine is owned and will be developed and operated by Cleveland-Cliffs.

Freeport Plans Fourth Mine

Freeport Sulphur Co. has announced plans for the development of a new sulphur mine—the company's fourth new sulphur project in two years—at a salt dome deposit in the Louisiana marshland.

The dome, known as Chacahoula, is located in Lafourche Parish 60 miles west of New Orleans. Freeport has been conducting an extensive drilling program there since last April. The area lies in the midst of dense cypress swamps, and the undertaking will involve unusual and costly engineering and construction difficulties, according to Langbourne M. Williams, Jr., president of the company. The size of the mining plant to be built will depend upon further studies of these problems, he said.

Freeport's Bay Ste. Elaine mine, which is on the Louisiana coastline southwest of New Orleans, began production recently. Garden Island Bay, located at the mouth of the Mississippi River, and the company's other new project, Nash in Texas, are in the process of construction.

TCI Retires Muscoda No. 4

After 65 years of operation, the Muscoda No. 4 mine of the Tennessee Coal & Iron Division of U. S. Steel Corp. has been closed down. The mine's ore reserve has been exhausted.

Opened in 1888, only two years after TCI moved into Birmingham, the mine has been driven back about two miles from the portal and has reached a depth of 960 ft below sea level at its lowest point. Elevation at the tipple is 720 ft above sea level.

Look At Iron Sulphide Ores

Minnesota's iron sulphide deposits in Aitkin and Carlton Counties some day may not only provide the state with a new sulphur industry, but also may prove the missing link in the development of Cuyuna Range manganese, Paul T. Allsman, Region V Regional Director of the U. S. Bureau of Mines, said recently.

A report just released by the Department discloses that tests on iron sulphide ores from two deposits in the Minnesota counties averaged 87 percent recovery of sulphur. The relatively low-silica content of the concentrate also indicated that a high-grade iron oxide sinter suitable for blast furnace use by the steel industry could be produced after recovery of the sulphur from the concentrates, Mr. Allsman said.

Perhaps even more important is the possible use of these iron sulphide deposits in the development of a Minnesota manganese industry from Cuyuna Range manganiferous ores. Using sulphur dioxide gas, the Bureau is currently conducting pilot-plant tests in the recovery of manganese from Cuyuna carbonate slate ore in a sulfatizing furnace in the Mines Experiment Building. This will be followed by the final leaching step in a flotation mill to be installed in the Bureau's manganese pilot plant at Fort Snelling.

Michigan Copper Output Down

Copper output from Michigan mines and tailings reclamation plants, was about 21,812 tons in 1952. This represents a 13 percent drop from 1951. The decline was chiefly caused by curtailed operations at the Copper Range Co.'s Champion mine during the railroad strike last fall. Quincy Mining Co., the state's other copper producer, maintained relatively uniform operations throughout the year.

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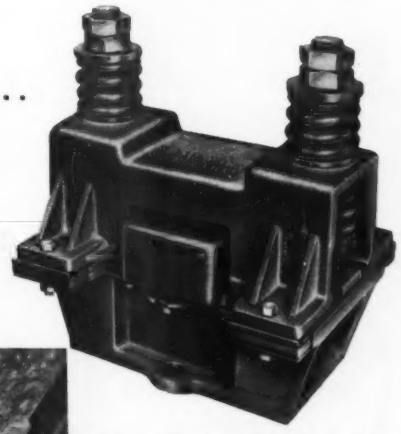

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If you are this man, please send a complete description of your qualifications to Box 17, in care of this publication.

Coal Lessors Meet

The National Council of Coal Lessors, holding its annual membership meeting in Washington, D. C., elected the following directors for the coming year: S. T. Brown, Roanoke, Va.; Rolla D. Campbell, Huntington, W. Va.; Roger F. Cooper, Lexington, Ky.; Robert M. Fisher, Indiana, Pa.; J. M. B. Lewis, Jr., Bluefield, W. Va.; and J. G. Puterbaugh, McAlester, Okla.

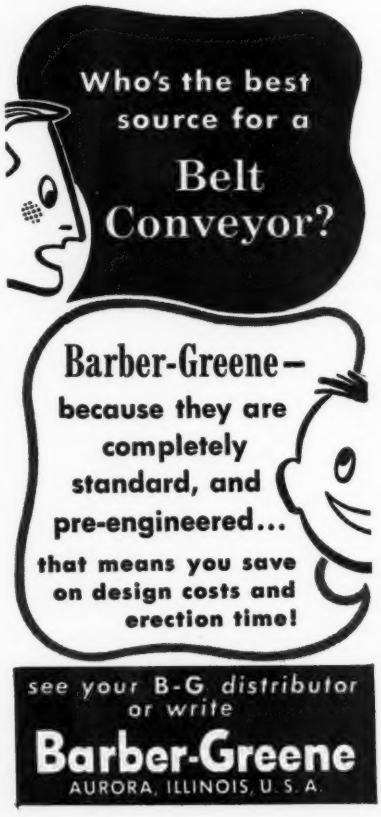
Current officers of the organization are Mr. Cooper, president; Mr. Campbell, vice-president; Mr. Lewis, secretary; and Mr. Brown, treasurer.

Improve River Facilities

EVER since 1758 when 16 English boatbuilders from Philadelphia began fashioning scows out of timber from the forests around Fort Pitt, barge traffic on Pittsburgh rivers has been growing. Pacing this growth has been the development of locks and dams which converted the rivers into dependable two-way arteries of commerce.

This year will witness completion of a vital project to improve river navigation even more in the Pittsburgh area. Dravo Corp. expects to finish, in the fall, reconstruction of the landward lock of Locks No. 2 on the Monongahela River at Braddock, Pa.

Measuring 720 ft long by 110 ft wide, the new chamber will accommodate 13 one-thousand-ton capacity coal barges and a towboat. The old locks could handle only four barges so the standard tows of six barges and towboat had to be broken up for "double locking," a time-consuming process.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Lehigh Mining Scholarship

Lehigh University trustees have received a new scholarship fund for students in mining engineering. Established through a bequest of $30,168 by the late Mrs. Esther R. Fuller Warwick, Honesdale, Pa., the new fund will be known as the John T. Fuller endowment fund. It is in memory of Mrs. Warwick's father, a Lehigh University alumnus.

The income from the trust fund will be used "to grant a scholarship in the department of mining engineering to a deserving Pennsylvania boy working his way through Lehigh University." Grants will be awarded on the basis of financial need, character and high scholastic achievement.

The number of awards each year will depend on the income available from the fund and the qualification of the candidates. The first award will be made this September. Applications for the scholarship grant will be processed by the office of admissions.

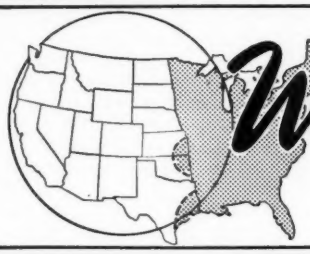
Fuller, who died May 18, 1939, was graduated from Lehigh University in 1903. He went to the diamond mines of Kimberly, South Africa, immediately on finishing his collegiate career. There he managed the largest diamond mine in the world and soon proved his skill to the DeBeers interests which operated the duTortspur Mine there. He became known in engineering circles as an expert in diamond mining before entering the employ of the Canadian Copper Co. and later the Aluminum Co. of America.

Show Safe Driving Habits

National Safety Council has announced a new sound slidefilm, "Operating Heavy Duty Trucks Safely," produced especially for those engaged in hauling operations in quarries, construction, open-pit ore mines and coal strip mines.

The film shows those who operate and work around heavy trucks the safe practices that will prevent the most frequent and serious accidents on company property. Among the topics covered are safe methods of driving, towing, dumping, riding and getting on and off heavy duty trucks. The film features several spectacular shots of accidents.

The 35mm sound slidefilm can be used on automatic as well as the bell type of projection equipment. For additional information and prices, write the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.



Western States

Denver Mining Meet

On February 12, 13 and 14 the Colorado Mining Association sponsored its 56th Annual Western Mining Conference in Denver.

Blair Burwell, president of the Colorado Mining Association, opened the conference with an address of welcome and introduced R. S. Palmer, manager of the association. Palmer discussed the place of the domestic mineral industry in our economy and pointed out how nationalization of the industry in foreign countries has affected world markets.

Representative John J. Rhodes of Arizona assured his listeners that the Congress is well aware that the small miner is "the guts of the industry." He urged that the industry be ready to assist the legislators with advice, concrete proposals and unselfish aid to work out its problems.

The Small Mines Panel considered many of the problems confronting the small miner. Among those discussed were: low prices of lead and zinc; shortage and high cost of skilled miners; and present high production costs.

Edward J. Bloom, attorney of Spokane, Wash., outlined a ten-point resolution containing suggestions for correcting the ills of the industry that have grown out of the socialistic trends of the last 20 years.

Felix E. Wormser, vice-president, St. Joseph Lead Co., delivered an address entitled "Our Mining Program." At other sessions on Thursday morning various papers on ore treatment and geology were presented.

At the Gold luncheon Charles W. Merrill, assistant chief, Minerals Division, U. S. Bureau of Mines, was the principal speaker. His topic was "Peace and Gold."

The National Committee on Lead and Zinc in its report presented a resolution calling for a sliding-scale stabilization import tax on lead and zinc to protect the domestic lead and zinc mining industry from low-wage foreign imports.

On Friday morning the problems of the uranium mining industry were thoroughly threshed out. Concurrently, in two other sessions, papers were presented on metallurgical and milling problems.

At luncheon on Friday Dr. Bruce W. Gonser of Battelle Memorial Institute spoke on "Metals, Mining and Mediation." He was followed by Brymer Williams of the University of Michigan who outlined the contributions of chemical engineering to the advancement of the minerals industries. During the remainder of the afternoon a series of addresses were heard on various topics dealing with metal and nonmetallic mineral mining, metallurgy and exploration.

The Gold and Silver banquet was held Friday evening with Jess Larson, of General Services Administration fame, as toastmaster. Principal speaker of the evening was Senator Hickenlooper of Iowa. In speaking of uranium production in Colorado and Utah he stated that the Atomic Energy Commission must retain control of the atomic energy program, at least until our national security has been established. The two other speakers of the evening were Dr. A. L. Miller, chairman of the House Committee on Interior and Insular Affairs, and Representative Carroll E. Kearns of Pennsylvania.

Saturday's sessions dealt variously with monetary problems, strategic metals programs, geology, mining problems and stream utilization.

In a thought-provoking summation on Saturday, Otto Herres, vice-president, Combined Metals Reduction Co., called for full support of the new administration in Washington lest, ". . . bright aspirations . . . come to confusion." He also predicted: That Free-Traders are going all-out to put over their philosophy; that the Congress will enact legislation to preserve domestic mining—provided the entire industry will unite on a sound program.

There was a heavy attendance at the famed Sowbelly dinner on Saturday night. The guest of honor was John W. Valentine who, as toastmaster, had contributed to the success of many previous Sowbelly dinners. His successor, James Colasanti, bids fair

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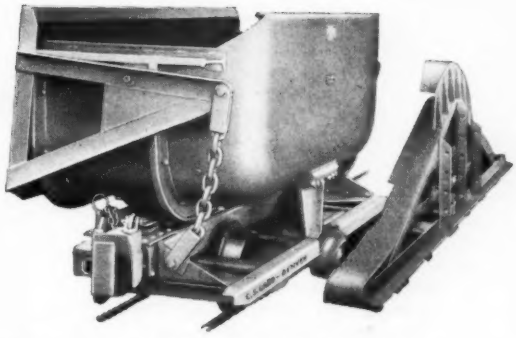

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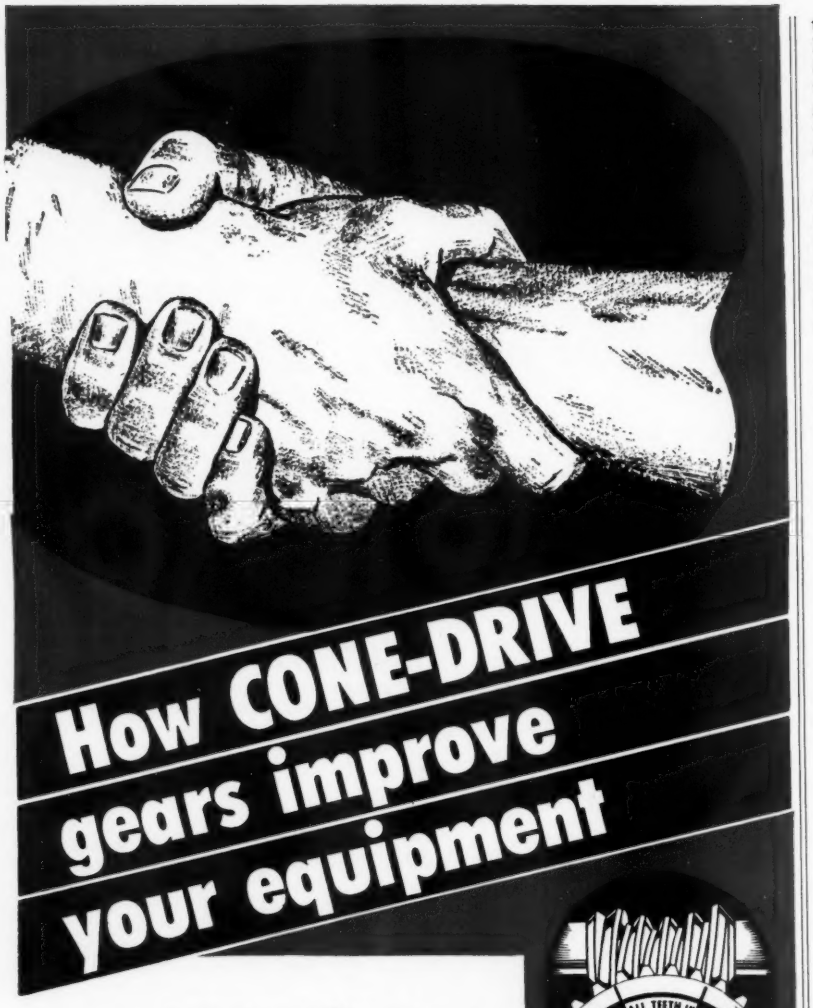

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to carry on the Valentine tradition. Principal speaker of the evening was Senator George W. Malone of Nevada. Governor Dan Thornton addressed the group, extending the greetings of Colorado and hoped everyone would be on hand for next year's festivities.

Safety plaques were awarded in recognition of outstanding accident prevention records to several mining companies and the evening was given over to entertainment by Captain Eddie Peabody, U. S. Naval Reserve and banjoist extraordinary and a succession of other excellent artists.

Elected at the business meeting on Thursday morning were: President, Harrison S. Cobb; vice-presidents, Charles A. Chase, Harold S. Worcester, E. D. Dickerman and M. P. Cloonan; treasurer, H. W. C. Prommel; executive vice-president, Robert S. Palmer.

Golconda Installs Hoist

Golconda Lead Mines has installed a larger hoist and a 32-cu ft skip at its recently unwatered main shaft at Wallace, Idaho. The new equipment is expected to speed up rehabilitation of lower workings. The new hoist and skip replaces a tugger hoist and bucket arrangement used for earlier unwatering and clean-up work.

Rehabilitation of the 1800-ft level crosscut has been completed for 300 ft. Little work has been done on the 1600-ft level except for cleaning up the station.

Anaconda Buys North Butte

Properties and equipment in the Butte, Mont., area of the North Butte Mining Co. have been purchased by Anaconda Copper Mining Co. The transaction includes the Granite Mountain, Speculator, Tuolumne, Gem, Sarsfield and Main Range mines.

Although not operating at the present time, the North Butte firm has been a large operation. It was organized in 1905 and operated continuously until 1923. Since then, its operations have been intermittent.

Alaskan Mercury Quickens

The national requirements for quicksilver have enlivened activity in Alaska cinnabar operations that have been on standby basis during recent years. An operating company just formed has acquired leases in the lower Kuskokwin area at Sleepmute, Crooked Creek and Decoursey Mountain and has completed its financing for full scale operations without need for public offering of stock. Tests in the Sleepmute area, the only location presently in operation, showed good ore and plans are developing to put the other two locations into operation as soon as a qualified mining superintendent can be located.

Scholarship Honors Larson

President J. E. Buchanan of the University of Idaho has announced that the first permanent scholarship endowment fund to be used for the School of Mines has been established by the Sunshine Mining Co., of Kellogg. The scholarship is in memory to the late A. E. Larson, former president of the firm.

Montana Mining Association

At the meeting of the Mining Association of Montana held at Helena on January 29, the following officers were elected: Ted Collins, trustee of the Marysvale Gold Mining Co., president; Fred Burnet, superintendent of the Montana Phosphate Products Co., first vice-president; Charles Burris, plant manager for Ideal Cement Co., second vice-president; L. B. Manning, general manager of the Trout Mining Div., American Machine and Metals, Inc., executive committeeman-at-large; W. R. Allen, chairman of Bostana Mines Co., chairman, resolutions committee, and Carl Trauerman, president of the Butte Copper Consolidated Mines, secretary-treasurer.

Seattle as seen from Queen Ann Hill is a thriving metropolis

Mining Convention in Seattle

SEATTLE, Wash., will be the scene of the Western Division's 1953 Metal and Nonmetallic Mineral Mining Convention. The dates set for the meeting are Monday to Wednesday, September 21, 22 and 23, with important trips scheduled for Sunday, September 20 and Thursday, September 24.

While this convention will climax the 56th year in the history of the American Mining Congress, it will be the first time the Queen City has acted as host. But the people of Seattle have seen an influx of miners from all over the world before. In 1897 this then little-known lumbering town was transformed almost overnight into an important commercial center when news of gold in Alaska and the Yukon brought eager miners from everywhere to the jumping off point for the north country. The 1953 rush of miners to Seattle will find a thriving city well prepared to take care of all visitors.

Under the direction of Western Division Chairman Robert M. Hardy, president, Sunshine Mining Co., committees are being appointed, plans are being made and hotel accommodations coordinated to ensure a successful and smooth-running convention.

On the serious side, the general convention sessions will consider many of the problems confronting the industry in dealing with government, with labor and with mining's place in the continuing effort to maintain America's leadership in the world family of nations. To bring out the best thinking on these topics, government officials, members of Congress and pre-eminent mining men will offer their opinions. Out of these deliberations will come the Declaration of Policy reflecting the consensus of the entire mining industry on matters of moment to industry and to the nation.

At the technical sessions, latest advances in underground and open-pit mining methods and metallurgical treatment will be discussed by leaders in their fields.

On the lighter side, convention goers will enjoy the Miners Jamboree—this time in an entirely new setting—and the 1953 edition of the Annual Banquet followed by top notch entertainment in the best American Mining Congress tradition.

The program of trips will be a valuable and pleasant part of Convention Week in Seattle. On Sunday, September 20, tentative plans call for a morning ferry ride to Bremerton and the Navy Yard and an afternoon jaunt to the School of Mines at the University of Washington. On Thursday, September 24, plans are quite definite for an all-day boat and sightseeing trip to Victoria, B. C., on beautiful Vancouver Island. In addition to these excursions, there will be other visits to important mining and industrial installations in the vicinity.

In view of the heavy attendance expected, members of the Seattle Hotels Association have promised a large quota of comfortable rooms. Applications for reservations should be sent promptly to the Housing Committee, Seattle Hotel Association, 315 Seneca St., Seattle, Wash.

The 1953 Metal and Nonmetallic Mineral Mining Convention is an event that must not be missed. Plan now to be in Seattle September 20-24.

Washington & USBM Enter Pact

A co-operative plan for the joint examination of coal mines by Federal and State inspectors has been entered into by the state of Washington and the U. S. Bureau of Mines.

The agreement, signed recently by Bureau Director John J. Forbes and Governor Arthur B. Langlie of Washington, is in accordance with provisions of the Federal Coal Mine Safety Act of 1952. Under the agreement, all inspections of Washington coal mines covered by the provisions of the 1952 Act will be made jointly by Federal and State inspectors, except in emergencies where an inspection is urgently needed and the State Inspector is not available.

Utah Mines Plan Merger

A proposal to merge the Silver King Coalition Mines Co. and Park-Utah Consolidated Mines Co. into a new company yet to be formed has been approved by directors of both companies.

Officials of both companies believe the advantages of consolidation are obvious and that joint operation of the two adjoining properties would lead to greater efficiency in exploration, production, drainage and similar operations.

Both properties are located in the Park City district of Utah. They produce lead, zinc, copper, gold and silver. American Smelting and Refining Co. owns approximately 25 percent of Silver King and Anaconda Copper Mining Co. owns almost 23 percent of Park-Utah.

Zirconium Production

The United States Bureau of Mines is producing zirconium at the rate of more than 100,000 lb yearly. At present, the Bureau is the only domestic producer and the entire output is going into defense work. It produces the metal at Albany, Ore.

Coal Operators Meet

On January 21 the annual meeting of the Colorado and New Mexico Coal Operators Association was held in Denver, Colo. The following officers were elected for the next year: L. M. Cooley, Edna Coal Co., president; J. R. Kastler, Rocky Mountain and Pacific Co., vice-president, and W. J. Johnson, Arrowhead Coal Co., vice-president. O. F. Bridwell was re-elected secretary-treasurer of the association.

Federal to Merge Into AS&R

American Smelting & Refining Co. and Federal Mining & Smelting Co. will merge through an exchange of stock. Federal is a 55 percent-owned subsidiary of AS&R.

Although the merger has been approved by directors of both companies, it is subject to approval by stockholders of each company. Special meetings have been called for this purpose immediately following the regular annual meetings, which will be held April 13 for Federal Mining shareholders and April 28 for American Smelting & Refining stockholders.

Sunshine Antimony Plant

The antimony plant constructed during World War II by Sunshine Mining Co. is being reactivated by that company. The plant was shut down in January, 1944, because of a change in the Sunshine mill flowsheet.

Smelting rates have been increased on the tetrahedrite content of the bulk concentrate produced by the company. The tetrahedrite ores of the Sunshine mine, and some of the adjoining properties it operates, contain antimony along with silver and copper. Now the company proposes to separate the antimony from the tetrahedrite concentrate to offset the increases in smelting charges.

Changes in the mill circuit will separate most of the tetrahedrite from the remainder of the bulk concentrate and the antimony plant will remove the antimony.

Oklahoma Coal Mine Bought

The Sallisaw Stripping Co. has purchased the Garland Coal Mining Co., which operates a mine at Stigler, Okla. The mine is a strip mine.

Tungsten Concentrator

A tungsten concentration plant with a capacity of 100 tpd has been completed at Toy, near Lovelock, Nev., by the Trojan Mining and Milling Co. The plant will handle custom ore besides treating the product from the company's Trojan scheelite mine in the Ragged Top Mountains.

Sterling Process

(Continued from page 49)

major rebuilding, of 85 percent can be maintained, giving a net production per calendar day of between 30 and 35 tons, at a recovery of 95 percent.

Electrode breakage has been eliminated, and electrode consumption is about 18 lb per ton of slab zinc produced.

Satisfactory refractory life is indicated on the basis of the first campaign, and on the behavior of the furnace since the second campaign started.

Problems connected with pressure surges in the furnace due to irregular movement of the charge banks have been satisfactorily solved.

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Substantially all of the zinc and secondary values are eliminated from the slag. Pig iron will, in certain cases, yield a substantial credit; any copper and gold present tend to follow the iron, and, under favorable conditions, the iron can be treated in a copper reverberatory or converter or in a lead blast furnace to recover these values. Over 90 percent of the lead and cadmium will be in the molten condensed metal; part of the lead can be recovered by liquation, and the remaining lead and any cadmium can be recovered by refining, if this is economical. Any silver will be distributed approximately two thirds to the zinc and one third to the iron. Silver in the iron can be recovered with the copper and gold, as previously mentioned, and the silver in the zinc can be concentrated in refining.

The development of the Sterling Process has now reached the point where it has been demonstrated that the difficulties which heretofore have prevented the smelting of zinc in an electric arc furnace have been overcome, and the commercial application of the process may be expected.

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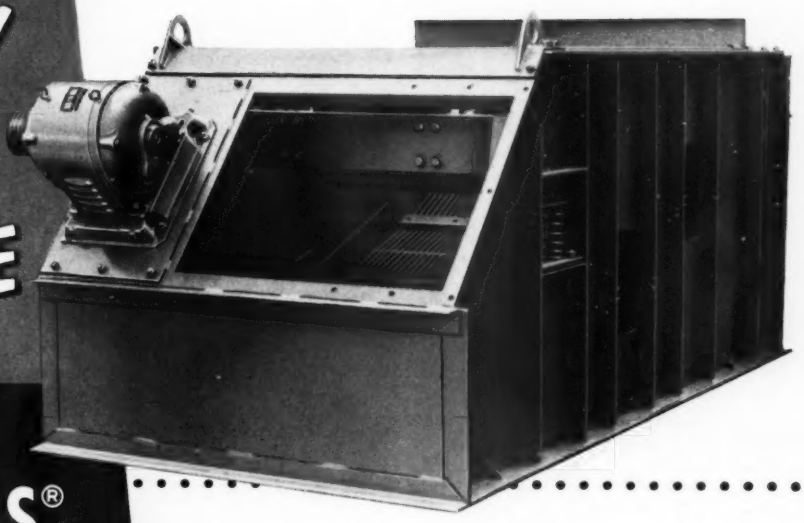

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- *Long lasting, low cost rods are easily adjusted or replaced.*
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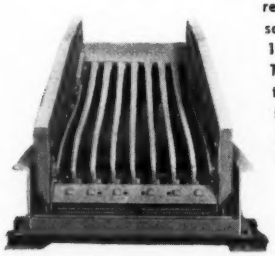
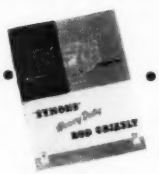
This grizzly is ideally suited for service following most sizes of primary crushers and scalping operations requiring separations at ¾" or larger.



The Symons Bar Grizzly is recommended for large tonnage scalping where clear spacings of 1½" and larger are permissible. The powerful vibrating action of the Bar Grizzly makes it particularly effective for wet, sticky or gummy materials. The sloping, curved bars of the Symons Bar Grizzly tend to tumble the material as it passes over the screening surface. The tumbling action effectively assists in separating the undersize.



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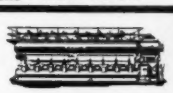

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Uranium Output Up

REPORTING activities for the last half of 1952, the Atomic Energy Commission said that domestic uranium production continued to increase and that further increases were expected during the coming year. The report pointed out that the Colorado Plateau area remains the "most favorable" area in the country for discoveries of new ore bodies, although exploration programs have revealed other areas as potential producers.

Two new sources of uranium yielded their first production during the last half of the year. These new sources are the gold ores of South Africa and the phosphate rock of Florida. Progress is also being made toward bringing other new uranium sources in Canada and Australia into production.

Government and private airplanes put in many hours of flying time during 1952 in airborne search for new uranium deposits. The Government's aerial reconnaissance was carried on in the Black Hills of South Dakota, in the Big Horn and Powder River basins of Wyoming and on the Colorado Plateau. More thorough exploration is later made, including drilling, if airborne instruments indicate possible presence of ore. The Black Hills and Wyoming areas are among the areas where uranium deposits may soon be found.

Bonus payments for initial production of ore have exceeded $1,000,000, the report said. Payments were made to 160 certified mining properties. It was also reported that 850 miles of access roads had been built under the Federal Aid Highway Act of 1950, to help open up new districts on the Plateau.

Construction of facilities at a number of uranium processing mills was reported, with further modifications planned. The largest expansion was at the Uravan, Colo., plant of U. S. Vanadium Co., where capacity was about doubled. Other expansions occurred at the Salt Lake City plant of Vitro Chemical Co. and the Grand Junction plant of Climax Uranium Co. Work is also proceeding at the Anaconda's Grants, N. M., ore-processing plant. Ore is being stockpiled there in preparation for the opening of the plant in late 1953.

Plans for other new processing plants were also mentioned. An addition to the Vanadium Corp. of America plant of Hite, Utah, is being considered, and another new ore processing plant is planned at Shiprock, N. M., by Kerr-McGee Oil Industries, Inc. This company has arranged for the acquisition of the properties of the Navajo Uranium Co.

The new ore-buying depot and sampling plant at Edgemont, S. D., was reported to have started purchasing ores in December, providing a market for the Black Hills area and neighboring Wyoming. It was built and is operated by the American Smelting & Refining Co., which also operates depots at Marysvale and Monticello, Utah, and at Shiprock, N. M. Mention was made of the projected ore-buying depot at Green River, Utah, construction of which is expected to start early this year.

The report went on to announce the submission of a report by the Colorado School of Mines Research Foundation on its study of the ore-sampling procedures used by the various mills on the Plateau. No intentional irregularities were found but various recommendations were made for improving the sampling methods.

Construction of a pilot plant to test new processes for extracting uranium from ore was also begun at Grand Junction. It will be operated by the American Cyanamid Co.

The AEC's report says that its domestic exploration program, consisting largely of geological investigations, airborne radiometric reconnaissance surveys and exploratory drilling has been expanded rapidly and will be further expanded to meet the needs of the production program. Over 1,000,000 ft of exploratory holes were drilled. Underground exploration continues in the Colorado Front Range. Other areas of underground exploration are the Boulder Batholith area of Montana, from which several minor ore shipments are reported, and the Couer d'Alene district of Idaho. In the Marysvale, Utah area, the Vanadium Corp. of America has undertaken a major underground exploration and development program, and substantial amounts of ore continue to be produced from this district.

First production of uranium from phosphate rock was made at a plant in Joliet, Ill., by the Blockson Chemical Co. Additional plants are being built in Florida and Texas.

Outlook in Lead

(Continued from page 56)

figure of 850,000 tons of secondary lead as against the Commission's 750,000 tons. In view of the discussion above, 850,000 tons is an inflated projection because of the inclusion of new scrap. The deduction of new scrap from the projection thus brings it within the same range as the Commission's projection.

Projection Questioned

The method of projection used by Mr. Fletcher is itself, however, open to serious question. Noting that scrap production has been 43 percent of consumption for the past five years, he then proceeds, oddly enough without any explanation, to the assumption that scrap production in 1975 will be at the theoretical optium rate of 60 percent of consumption. As stated in the Commission's report (Vol. II, p. 41) this rate of 60 percent refers to the average for the years 1947-1950, so Mr. Fletcher is further assuming that the end-use pattern of lead in 1975 will be the same as for the past few years. In contrast, the scrap projection in the Commission's report was carefully built up from estimates of the recovery that could be expected from the consumption of lead in its various individual uses projected for the period around 1975, with allowance for the length of the scrap cycle in each use.

In comparing the two estimates of needed net imports one can now take into account the comparative validity of the projections and estimates of consumption and production on which the import estimates are based. With respect to consumption, Mr. Fletcher has not provided a satisfactory alternative to the Commission's projection. His projection of scrap production is equally unsatisfactory. His estimate of mine production, on the other hand, can be considered to be as valid as the Commission's, and, for the purpose of judging his final conclusion, is accepted as the better. The result is as follows:

	Thousand short tons
Projected consumption in 1975 (PMPC)	1,950
Production:	
Estimated mine (Fletcher)	375
Projected scrap (PMPC)	750
Total production	1,125
Estimated required net imports	825

Disclaim Absolute Accuracy

Thus the acceptance of as much of Mr. Fletcher's alternative statistics as is valid fails to modify the Commission's conclusion significantly. This does not, of course, mean that the Commission has made an absolutely correct prediction or that the course of future events must now yield in 1975 the situation the Commission describes. One can, however, say that the Commission has reached what may be termed a reasonable conclusion as to the likely state of affairs for lead in the period around 1975—namely, that the United States will probably become increasingly dependent on imported lead in the next quarter century, and that this increased dependence is likely to be such that a large increase in foreign mine output will be required to satisfy U. S. demand in addition to the demand of the other countries of the free world.

Manganese Shipments Begin

Shipment of manganese has begun from the plant at Henderson, Nev., of Manganese, Inc. The plant is not yet up to full capacity, but should be shortly. It is currently treating mine run and stockpiled ore from the Three Kids mine.

Process Montana Coal

Work has begun on a coal processing plant to produce char and other chemicals at the Bair-Collins coal mine east of Roundup, Mont. The P. D. & P. Processing, Inc., of Lewiston, Idaho, through its president, Bill Pringle, reported that the first tube of the new plant will be ready for operations in March.

USSR&M Raises Trees

United States Smelting Refining and Mining Co. of Lark, Utah, has a plan for reforestation. The firm plans to plant between 15,000 and 20,000 pine seedlings during the year. It already has put in 10,000 such trees in cooperation with the West Salt Lake Soil Conservation District, of which it is a member. Supervisor of the project is W. L. Latshaw, head of the smelting firm's agricultural department.

The tree planting project is expected to protect the mountain slopes from damaging erosion, which in turn may work toward an improvement of the Lark townsite water supply and ultimately benefit irrigation farmers.

In pioneer days, it is reported, there were sizable stands of timber in the area. No doubt this timber, which has long since disappeared, went into the mines and the homes of the pioneers.

Patent Drilling Gadget

James E. Thomas and Clarence D. Anderson of Kellogg, Idaho, have come up with a new drilling gadget. The two men have patented a drilling support which enables a mucking machine to be used as a drilling jumbo. According to reports, the drill support which clamps rigidly to the bucket of the mucking machine, may be readily adjusted for horizontal, vertical or angular drilling from a single position of the mucking machine bucket.

Tungsten Mill Burns

Fire destroyed part of a tungsten mill at Nederland, Colo., January 18, causing $20,000 worth of damage. The mill is owned by Hetzer Mines, Inc., and is leased to Vanadium Corp. of America. D. C. Harrison, superintendent, reported the blaze apparently was caused by an oil heater.

Revamp Flotation Unit

Utah Copper Division, Kennecott Copper Corp., is making steady progress in revamping flotation machines at its huge Arthur and Magna mills near Salt Lake City, Utah. The changes call for replacing 56 rows of flotation cells at the Arthur mill with 720 larger cells in rows of 16 each. At Magna, the present 56 rows—a total of 640 cells—will be left intact and a series of cells added at the end of each row for retreatment of tailings.

Main objective of these changes is directed at increasing production of molybdenum. The project will require the addition of another roaster at the Arthur plant to handle the recovery of the molybdenum. No changes in the structure of mills is anticipated. There will be no increase in flow of pulp or ore through the mill.

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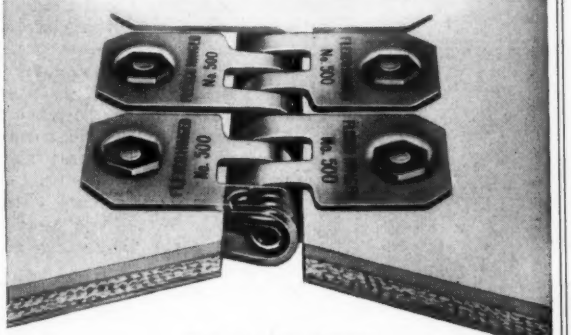

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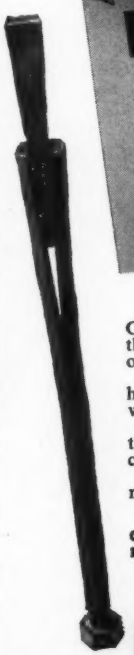

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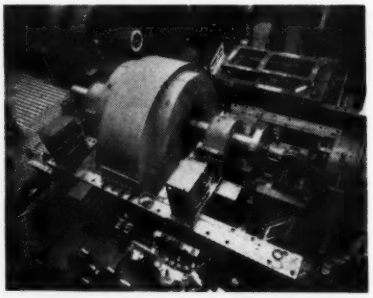
Manufacturers Forum

World's Most Powerful Motor

The pictured 83,000-hp motor—most powerful ever built—is one of two being completed by the Westinghouse Electric Corp. for driving the wind tunnels of the U. S. Air Force's Arnold Engineering Development Center at Tullahoma, Tenn. The two large motors will be coupled with two



25,000-hp motors to form a 216,000-hp drive for the compressors for the supersonic and transonic wind tunnel. The entire assembly will be the largest rotating machine ever built. Shown during completion of tests at the Westinghouse East Pittsburgh, Pa., plant, the motor stands 21½ ft high and weighs 225 tons.

Recover Mercury

To provide a dependable method of recovering mercury globules and mercury-laden dusts, and, at the same time, combat the hazards of mercury vapor poisoning, Acme Protection Equipment Co., 307 West Lake St., Chicago 12, Ill., now offers specially designed equipment, known as the Acme Mer-Vac.

The Mer-Vac is a combination of an enlarged gas mask canister for mercury vapor collection and a powerful industrial vacuum cleaner for mercury recovery, it is stated. The unit is engineered to provide the following features according to the announcement literature: a synchronous timer indicating when canister contents must be replaced; a special air circulation system for the motor, preventing amalgamation of wiring connections and parts; glass trap for mercury recovery; stainless steel and porcelain enameled canister parts; acid-resistant dust filter; all other parts subject to attack by mercury and other chemicals are of non-corrosive materials.

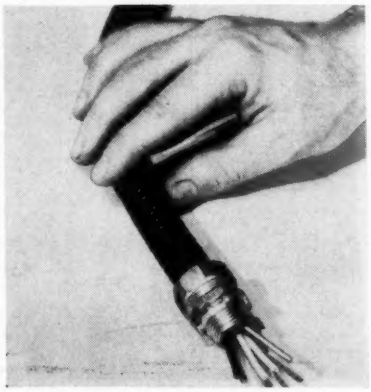
Air Locomotives

Eimco Corp., 634-666 So. Fourth West St., Salt Lake City 10, Utah, has introduced an air locomotive for use in sections of a mine where hand tramming has been accepted and where tonnages and rate of work was not large enough to warrant the investment in battery or trolley transportation. The new locomotive incorporates a two-speed constant mesh transmission, and a heavy truck and frame assembly with anti-friction bearings.

Waterproof Flexible Conduit

"Sealtite" Flexible Electrical Conduit Type UA is the first of its kind to gain Underwriters' Laboratories approval for use in wet locations. This liquid-tight flexible metal conduit is manufactured by The American Brass Co. of Waterbury, Conn.

The tough covering protects wiring against moisture, oil, dirt, chemicals, and corrosive fumes—on perma-

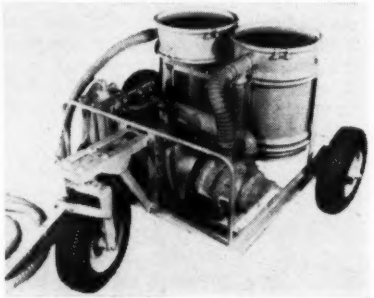


nent and temporary installations. Conduit is made of spirally wound, interlocked zinc-plated steel strip with a copper bonding conductor wound spirally in the space between each convolution on the inside of the conduit. It is available in long lengths in nominal electrical ID sizes ⅜ in. to 1¼ in. inclusive.

Approve Dust Collector

The United States Bureau of Mines has tested and approved the electrically driven new "MSA Bolt Hole Cleaner" designed for collecting dusts produced in rock drilling in coal mines.

One rotary roof-drill manufacturer has already concluded arrangements with MSA to install the dust-collecting units on all its roof-bolting drills



as standard equipment, it was added. Other drill manufacturers have expressed interest in similar arrangements.

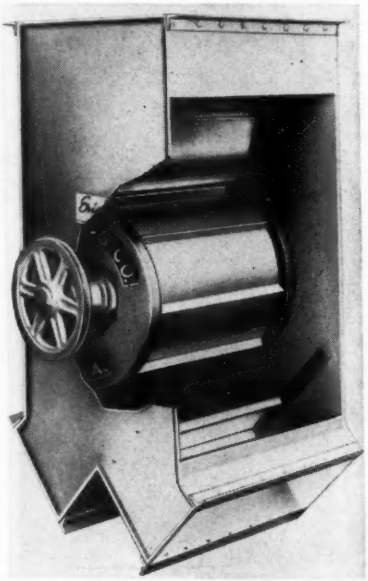
Various assemblies are being offered so that users can select a source of power best suited to their current operations. A mechanically driven unit has been designed for permanent mounting on either electric rotary drills or compressors. This unit takes advantage of a mechanical source of power to drive a vacuum pump, eliminating the need for electric motors or the necessity for borrowing air intended for drilling.

A Mine Safety spokesman said approval has been secured for the unit's operation in any of seven different ways. It can be used for electric rotary drilling vertically upward through channel, and diagonally upward. For pneumatic drilling, approval has been granted for drilling vertically upward, upward through channel, diagonally upward and vertically downward.

A printed bulletin, Number 1504-1, containing full details is available from Mine Safety Appliances Co., Braddock, Thomas and Meade Streets, Pittsburgh 8, Pa.

Improve Magnetic Drum

Improvements and modifications designed to increase efficiency have been made on all Eriez permanent Magnetic Drums, it is announced by the Eriez Manufacturing Co., Erie, Pa. The drums remove tramp iron and medium fine ferrous contamination



automatically from materials conveyed in spouts, chutes and other conveying systems not employing belts.

Among the many improvements incorporated in the new Magnetic Drums are: changeable sheave sizes for various operating speeds; stainless steel shells that resist pitting and corrosion; dust-tight construction; light-weight, rigid, cast aluminum sides; adjustable feeder assemblies; smooth running and oil-sealed bearings, and extended discharge ducts.

Improve Chain-Hoist

The new Model R coil-chain ratchet-lever hoist, now in production at Coffing Hoist Co., Danville, Ill., introdues many new convenience and safety features, according to the manufacturer. The Model R retains the unique ratchet and pawl operating principle originated by Coffing and used in previous models for over 25 years.

Use of coil instead of roller chain in the Model R is said to permit the chain to swing or wrap easily in any direction. When not under load, it may be pulled freely through the hoist head for quick adjustment. The handle operates in any position, it is stated, which solves the problem of working in cramped quarters or where there is little head room. Safety stops prevent spinning of the handle.

The hoist has but few parts, and can be completely disassembled in seconds with only a screwdriver, according to the manufacturer. The unit is available in 1500- and 3000-lb capacities. The handle also serves as a "safety valve" in that it will bend under maximum overload conditions, thus giving the operator warning to prevent breakage and dropping the load.

Further information on this advanced design unit is available from the Coffing Hoist Co., 800 Walter St., Danville, Ill.

Announcements

Frank E. Fisher, assistant to the sales manager of **Goodman Manufacturing Co.,** retired on December 31. Fisher had been with Goodman for more than 35 years.

Union Wire Rope Corp. has announced that **Joseph T. Broadus** will represent that company in California and **Frank W. McSpadden** will represent the company in Georgia and North and South Carolina.

Dr. Cyril G. Veinott, nationally known electric motor design engineer, inventor and author, has joined the **Reliance Electric & Engineering Co.** as consulting engineer on ac machinery. Dr. Veinott comes to Reliance from the Westinghouse Electric Corp. where, for the past 25 years, he has been engaged chiefly in small motor engineering.

H. C. Allington has been elected vice-president in charge of Sales of the Eastern Division of the **Colorado Fuel and Iron Corp.** by the Board of Directors. He will supervise sales in the Eastern Division of all products manufactured by Colorado Fuel and Iron and its subsidiaries, including the recently acquired John A. Roebling's Sons Corp.

In a later announcement it was made known that **L. A. Watts** has been named general manager of Sales of the Eastern Division of the company.

Nelson L. Davis Co., Chicago, has announced the appointment of **Nicholas J. Ali,** chief engineer succeeding the late G. H. Bergstrom. Ali, formerly chief electrical engineer, joined the Davis Company in 1947 at the time of its organization.

W. Denis Kendall, executive vice-president of Brunswick Ordnance Corp., a subsidiary of Mack Trucks, Inc., has been appointed vice-president of **Mack Manufacturing Corp.** He has assumed the responsibility for all manufacturing at all Mack plants.

Gould-National Batteries, Inc. has appointed **W. H. Burkey** district manager for its Industrial Division in the St. Louis area.

Harold E. Kleintop has been appointed manager of Wire Product Operations of **Hewitt-Robins,** responsible for production and sales at the company's Philadelphia plant.

The **Rogers Iron Works Co.** announces the retirement of **Charles B. Rogers** as president and his election as chairman of the board of directors. The change in Rogers' position comes after more than 50 years as an officer and president of the company which bears his name. As chairman of the board, Rogers will no longer direct the detailed activities of the company but will be available for advice and consultation and the direction of over-all policy.

CATALOGS AND BULLETINS

BELT CONVEYORS. *The Jeffrey Manufacturing Co., Columbus 16, Ohio.* Catalog 852 is a virtual handbook on belt conveyors. It includes information on the latest designs of conveyor details and all engineering data necessary to design a belt conveyor for any application. Write to Jeffrey for a copy.

COAL LOADING MACHINE. *Goodman Manufacturing Co., Halsted St. and 48th Place, Chicago 9, Ill.* Sales Catalog CLT-524 describes Goodman's new Type 865 Loader for low coal. The loading machine has an over-all height of 26½-in. Catalog is available from above address.

DUST COLLECTION. *American Wheelabrator & Equipment Corp., 1204 South Byrkit Street, Mishawaka, Ind.* Case histories on dust collection are given in this eight-page, illustrated brochure which show how Dustube cloth-tube-type collectors are used in filtering gases from such equipment as lead blast furnaces, sintering machines, and cupolas melting slag. Other applications presented include dust control in dross sampling, coal cleaning and asbestos processing. Ask for bulletin 402.

FOUR-YD SHOVEL. *Marion Power Shovel Co., Marion, Ohio.* The new bulletin describes the Marion 111-M diesel shovel, with 4-cu yd dipper. Ask for Bulletin No. 402-A.

SCREW CONVEYORS. *Link-Belt Company, 307 North Michigan Ave., Chicago 1, Ill.* Comprehensive and detailed engineering information is given in this 92-page book, with selection tables and horsepower formulas, layouts and arrangements, dimensional data and part numbers, to permit selection of screw conveyors and screw feeders for many types of applications.

Engineering data and component specifications comprise 54 pages of Book 2289. Many practical suggestions for correct selection and arrangement of components are included.

Link-Belt Book 2289 will be sent without charge to engineers, designers and others to whom it will be of value.

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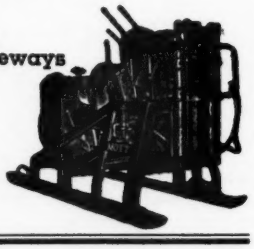

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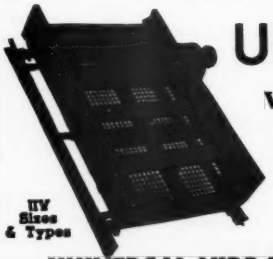

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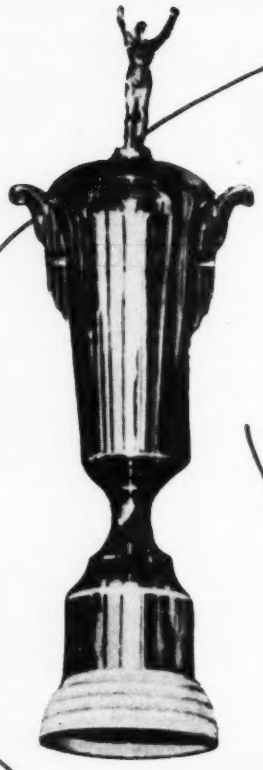

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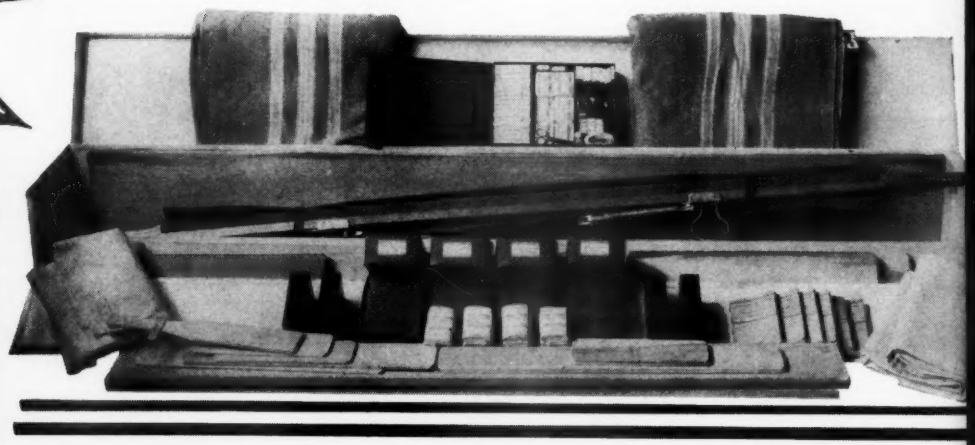

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